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THE GAS JOURNAL

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A Glance at the Contents—

New Coke Plant at Rochester.

We give an illustrated description of a new coke plant designed by Mr. C. Valon Bennett, of the Rochester, Chatham, and Gillingham Gas Company, and manufactured and erected by Messrs. Drakes, Ltd., of Halifax.

Midland Association.

A report appears of the annual general meeting of the Midland Association of Gas Engineers and Managers held in Birmingham last Thursday. The new President is Mr. H. J. Woodfine, Managing Director, Engineer, and Secretary to the Wellington (Salop) Gas Company.

"The Showroom Salesman."

This is the title of a paper by Mr. R. Farquhar, of Bristol, before the Western Junior Gas Association. Among other matters, the author mentions the success of an all-gas demonstration house which was organized by the Bristol Gas Company. During the winter 9000 people visited the house, and a large number of orders for gas appliances resulted.

Free Fires for Slot Consumers.

Introducing a discussion on the domestic use of gas, Mr. Frederick Shewring, at the annual general meeting of the Midland Association of Gas Engineers and Managers, mentioned that his Committee (Stratford-on-Avon) have instructed him to fix as an experiment about 25 gas fires free of cost for prepayment consumers. If increased consumption follows to justify the outlay, the Committee will adopt the policy of providing free one gas fire for each approved slot consumer.

Aldershot Gas, Water, and District Lighting Bill.

With a view to clarifying the position as to the powers of Government Departments to deal with the capital of companies supplying electricity and water in addition to gas, the promoters of the Aldershot Gas, Water, and District Lighting Bill applied to the Standing Orders Committee of the House of Commons to dispense with the Standing Orders, so that an additional provision could be made to the Bill. The Committee agreed to the suspension of Standing Orders.

Formation of Cokes.

This was the subject of a paper by Mr. John Roberts before the Institute of Fuel. The author points out that it must not be assumed that because the production of high volatile semi-coke is advantageous in low-temperature practice it is essential from the combustibility standpoint to have high volatile contents in the fuel. On the contrary, the percentage may be as low as 4, yet the combustibility will be perfectly satisfactory, so long as the texture of the fuel is right. Gas Companies can still make free-burning coke at high temperatures, as also can coke oven operators, while those who have no ready outlet for gas should leave as much as possible in the smokeless fuel, by treating coal at low temperatures.

London Juniors Visit Kent Colliery.

A visit to the low-temperature carbonization plant and colliery of Messrs. Pearson & Dorman Long, Ltd., at Snowdown, near Dover, was paid by the London and Southern District Junior Gas Association, under the Presidency of Mr. T. H. Prater, of Margate, on Wednesday, March 11.

Order To-Day—Fixed To-Morrow.

As will be seen from our "Service" page, in the recent very cold spell the Newcastle and Gateshead Gas Company were able to proclaim in the local Press that "there's nothing can give you comfort so easily and quickly as a gas fire. Order to-day—fixed to-morrow in your home." The objection of the ultra-cautious man who would think that, even so, he would only want his fire for a few days, was met in advance by "no charge made for hire from April to September."

Gas in Northern Ireland.

His Grace the Duke of Abercorn, Governor of Northern Ireland, performed the Official Opening, on Wednesday, March 11, at Coleraine, of a new installation of vertical retorts and a gasholder recently built at a cost of approximately £15,000. The vertical retorts comprise four Glover-West continuous retorts of the 40-in. "steaming" model, and were erected by Messrs. West's Gas Improvement Company, Ltd., and the gasholder is of 100,000 c.ft. capacity, erected by Messrs. R. & J. Dempster, Ltd., in an existing tank.

Staffing the Smaller Undertaking.

In his Presidential Address to the Midland Association of Gas Engineers and Managers, Mr. H. J. Woodfine said that in the small undertakings it must be admitted that the difference between revenue and expenditure will not permit of any technical help. The managers of these undertakings must, perforce, shoulder all the burdens of works and district, and all praise to them for the way in which they stand up to so big a task. But what of undertakings of 80 to 100 millions output? Surely these, if properly and efficiently managed, should be able to afford so necessary an officer as a technical assistant and chemist?

Atmospheric Pollution.

The issue, by the Department of Scientific and Industrial Research, of the 16th Report on the Investigation of Atmospheric Pollution calls attention again to the existence of the smoke problem and the extent to which attempts to solve it are meeting with success. Domestic smoke is now well recognized to be the principal contributory cause of the smoke nuisance in many of our large towns. Estimates for London and Glasgow have shown that smoke in these cities is 2½ domestic to 1 industrial and 3½ domestic to 1 industrial respectively. The burning of every ton of raw coal in a domestic open grate has further been estimated to cause 10s. worth of damage in many areas.

EDITORIAL NOTES

The Nottingham Trial

SINCE the termination of the trials which took place at the recent Nottingham Assizes, when, as was fully reported in the pages of the "JOURNAL," seven defendants were sentenced by Mr. Justice Talbot to varying terms of penal servitude and imprisonment, and two others were bound over, for their complicity in frauds extending over ten years in connection with the City's gas undertaking (the loss to the ratepayers, as far as had been ascertained, being estimated approximately at £100,000), the keenest interest has been manifested in regard to the result of the further examination of the accounts of the Department. This examination is being undertaken by the firm of Accountants who were originally called in, and whose investigations resulted in the speedy apprehension of the principal culprit, Leonard W. G. Ball, then Chief Clerk in the office of the Engineer and General Manager (Mr. John Wilkinson). Ball, who was shown by the evidence to be the author of the fraud, is now undergoing a term of seven years' penal servitude, and steps have been taken by the Corporation to secure restitution by him in the form of 53 houses and two business establishments which he had acquired by means of money stolen from the Corporation, as well as a large residence which Allen, an accomplice, was building for him at a riverside resort, Radcliffe-on-Trent. Some time must necessarily elapse before the Accountants' additional report can be available. When, however, their final conclusions have been arrived at, further matters may be expected to be made public, as, acting upon the instructions of the General Purposes Committee of the Corporation, the firm have also been authorized to examine the accounts of the various other trading departments of the Council, with the object of determining what changes are needed in their accountancy systems.

Meanwhile, it is a source of great satisfaction to record that since (as during the course of) the protracted Magisterial investigation and the subsequent Assize procedure, the wide esteem in which Mr. John Wilkinson is held, in professional as in private circles, has been indicated by the innumerable messages of regard which have reached him—a circumstance which is of a particularly gratifying, though perfectly natural, character, having regard to certain features of the cross-examination during the preliminary proceedings, when questions were put containing suggestions of which no justification was forthcoming. No one knowing Mr. Wilkinson ever expected that it would be. The opportunity which, since the termination of the criminal proceedings, has been afforded for weighing with impartiality all the considerations involved in relation to the management of the Nottingham Gas Undertaking has thrown into the clearest light the inestimable value of the services which Mr. Wilkinson has rendered to the Municipality. The quality of his work has, indeed, been amply evidenced by the financial results of the undertaking, which, during the twenty years of his official career in Nottingham, have, as is well known throughout the industry, been strikingly good. The opinion of his professional brethren on his qualities is summed up in the fact that Mr. Wilkinson has achieved the high honour of filling the Presidential Chair of the Institution of Gas Engineers.

Some compensation for the unjustified suggestions to which reference has been made will be found in the numerous communications expressive of sympathy and friendly regard which Mr. Wilkinson has received from members of his profession in various parts of the country; and to these expressions of sympathy and friendly regard it is desired here to add our own. For what it is worth, there is, on the authority of our Nottingham Correspondent, a partly redeeming feature in relation to Leonard Ball. Upon the eve of starting to serve his sentence, he desired it should be made clear, for the satisfaction of his old Chief, that he had been in no way responsible for anything which was calculated to bring into question the good faith of an esteemed official.

A Spirited Address

MR. H. J. WOODFINE, this year's President of the Midland Association of Gas Engineers and Managers, is responsible for the administration of a comparatively small concern—the Wellington (Salop) Gas Company—with an output of 150 millions. Twenty years ago the Company sold 40 million c.ft. a year, so that the progress which has been effected in a small agricultural town reflects the greatest credit on the business ability, as well as the engineering skill, of Mr. Woodfine. Both these qualities are needed for the success of any undertaking, from the largest to the smallest. This is obvious; it must also be obvious that until recently the engineering side, and not the business side, has held sway. The push for sales is, in fact, speaking generally, a new idea, in many instances owing its birth to the advent of electrical competition. Such lack of enterprise in the palmy days renders the public sceptical of the powers of service of the Gas Industry when electricity makes its appearance.

Now the Wellington Company has enjoyed, apart from competition with oil fuel, practically a non-competitive field until a few months ago, when electric current became available in the area. Wisely, however, the management did not rest content with a "reasonable" gas service; instead, continuous effort was directed towards rendering this service as perfect as possible. There is no doubt that the Company will now reap the fruits of its efforts, for a splendid rampart has been built against the invader. As Mr. Woodfine says in his address, there are few undertakings that can point to the opening of good-class showrooms as far back as 1907—24 years ago—yet the Wellington Directorate at that date purchased an island block of property in the centre of the town, and, at considerable expense, equipped it for showrooms, offices, workshops, and stores. They were early in the field, also, in the important matter of maintenance of appliances. "Such a scheme has been in operation for a period of eighteen years, and now that we are face to face with electrical competition, we are deriving the benefits of this service in the steadfastness to gas displayed by our consumers over a period of six months' intensive electrical 'touting.'"

It will be gathered from this that Mr. Woodfine attacks with zest both his particular task and the problems confronting our Industry. His address is, indeed, full of spirit; and he offers much constructive criticism. We thoroughly agree with his remarks about the retention of the domestic gas lighting load; in this regard he endorses a policy in which we have expressed our belief on many occasions during recent years. With modern methods of production and distribution, the Gas Industry is in a position to supply artificial light as good as, and more reliable than, electricity—a light which is not damaging to the eyesight and which serves the dual function of providing warmth and promoting ventilation. "But," says Mr. Woodfine, "it is imperative that we have more artistic fittings, more switches, still better

burners, and further-improved service; and if, through our salesmen, we extol the good qualities and advantages of modern gas lighting, we shall achieve the reward which I feel confident awaits us."

The tenor of Mr. Woodfine's address is Self-Help. While we are awaiting revision of existing legislation, there is ample opportunity for undertakings to adopt optional tariffs, to foster co-operation in the matter of discharge of effluents, to be prepared for the sake of "overheads" to be content with a small margin of profit on certain sections of our business, to regard plant extensions courageously, and to employ technical men and remunerate them adequately. He maintains that any works having an output of between 80 and 100 million c.ft. a year ought to employ, and at a salary which could not be criticized, a technical assistant and chemist. Without entering into any details concerning Mr. Woodfine's address, we might, in conclusion, call attention to his observation that, if it is pointed out to the railway companies that ammoniacal liquor is a waste product, considerable reductions in freightage can be obtained.

Are the Clouds Lifting?

In his address last week at the opening of the British Trade Exhibition at Buenos Aires, the Prince of Wales declared that there is a spirit of revival among the British industrialists, of which the exhibition is a sign. "The dislocation of the old highly organized methods of industry and commerce," he said, "has given way to a period of re-organization which is now ending. The process of adapting the mechanism of trade to new conditions is about complete. England has refreshed and strengthened her original powers. These are heartening remarks, which will lend support to the more hopeful feeling that is to be met with to-day. It is, perhaps, at the moment little more than a feeling, for examples of actual improvement in business are not easy to come by. But the very existence of this feeling should be accepted as a hint of the broadest kind by industrialists. Trading conditions are apt to change with little warning, and the signs and portents are that better things may be expected. It may not be amiss, therefore, to repeat the advice we have previously given to gas undertakings to make preparations for better business while conditions remain favourable. Now is the time to plan extensions where they are likely to be needed—while manufacturers generally are in a position to give prompt attention to new work, while money can readily be obtained on the good security which a progressive gas undertaking offers, and while raw materials are cheap.

The spirit of revival to which the Prince of Wales draws attention is undoubtedly of good augury; but for the time being we ourselves derive even greater hope from the fact that each day produces now some fresh evidence of the fact that at long last recognition is spreading throughout the country of the difficulties which it is up against. Much serious thought was occasioned by the appearance a few days ago of a report by the Federation of British Industries entitled "Industry and the Nation;" and it is fitting that reference should be made here to the main indications of this report. Politicians have interfered so much with industry, that industry (and papers concerned with industries) must be concerned with politicians. Our fiscal system has too long been a matter of party politics; it must now take its real place as a vital national problem. Six months ago, the Federation of British Industries adopted certain resolutions pressing for a change in the fiscal policy of the country, and in this new report there are set out the reforms which are considered essential. The argument is as follows: The Federation recognize the necessity for continuous development and rationalization within industry itself. In order to make this achievement possible, the expenditure of money is essential, and the pre-requisite necessary to the raising of this money, and the contemplated expenditure of it, is confidence. The view of the Federation is that this confidence can only be restored to industry by (*a*) a change in our fiscal system, including industrial protection, and the widest possible extension of inter-Imperial preference; (*b*) a reduction in the burden of taxation and other charges which have to be borne by British industry.

The report fully describes the proposed reforms, and the means for carrying them into effect. With regard to the suggested tariffs, there may be room for two opinions; as to the effect of crushing taxation, there can be but one. This one the Federation of British Industries state—that the present level of taxation is inconsistent with the rate of progress necessary to enable British industry to maintain its place in the industrial world, and that a continuance of it can only lead to loss of trade and a deterioration of British prestige. What is to be done? The Federation do not shirk the issue. As the alternative to financial disaster, they say it is a prime and urgent necessity that there should be a drastic reduction in national expenditure on a scale sufficiently large to render this burden much less onerous, even at the expense of reduced availability of services; and, further, this need applies with equal force in the Local Government field, where it is essential that a substantial contraction in non-productive expenditure should be secured. It is the belief that public appreciation of the gravity of the situation is growing which gives us hope that we are reaching the turning in the long lane.

A Robust Faith

Right through, the meeting of the Midland Association was a demonstration of that faith from which spring all good works—faith in an industry which, while confidence is reposed in it, will let down neither consumer nor undertaking; an industry which has already done so much, and is still capable of doing so much, for the community as to entitle it to kindly consideration for evermore. As its President the Association has a staunch supporter of the industry. Mr. Woodfine believes in fighting at the first ditch, rather than at the last—for he declares himself an enthusiast for keeping hold of the gas lighting load. This is the spirit that will maintain the vitality of the industry to the full. Those who are anxious to find something that is to be given away will not cast an eye upon the business of the Wellington (Salop) Gas Company.

The remark noted was made by the President during a discussion which was opened by Mr. Frederick Shewring, of Stratford-on-Avon—himself a doughty champion when "fighting for the lighting" is on hand. Mr. Shewring fights with the powerful weapon of modernization—the most successful in the armoury for retaining the lighting. Old lighting fittings must be brought up to date, and, what is more, they must be kept up to date, and they must be adequately maintained. His own views on fittings for general home lighting were given by him on pp. 30-32 of the "Journal" for October 1 last; but whatever may be the nature of the fittings, they cannot, without risk of lost custom, be left for an indefinite period to look after themselves.

Increasing vigilance is needed, if the flock is to be prevented from straying from the fold. It is a fact which each one can verify for himself that, as Mr. Morland said, gas for lighting is superior to electricity, because one can read by it for a longer period without tiring the eyes. Even this, however, is not conclusive, for numbers of people do not read for long periods. Gas needs more than its inherent good qualities; it must find also other means of pleasing, and we believe with Mr. Shewring that the switch is one of these means. Unfortunately, gas cannot claim great usefulness for (say) operating wireless sets or vacuum cleaners, but such shortcomings as these merely emphasize the need for keeping in view the many substantial advantages over its chief competitor which gas does possess. The discussion was full of good points, but as it is reported in the "Technical Record" of this issue of the "Journal," there is no need to enumerate them here. But one other must be mentioned because of its overwhelming importance. It is that in connection with lighting burners and fittings only the best is good enough. Seek plainness, if necessary, but do not allow the quality to suffer.

PERSONAL

Mr. GEORGE F. DONALDSON, of the Colchester Gas Company, has been appointed, out of 72 applicants, to the position of Distribution Manager to the Tunbridge Wells Gas Company.

The Managing Director of the Whessoe Foundry and Engineering Company, Ltd., Mr. R. B. HODGSON, sailed for South Africa on Feb. 27 on a business trip, and is expected to be away for about 3½ months.

OBITUARY

J. G. TAPLAY.

The death occurred, on Jan. 26, at the age of 61, of Mr. J. G. Taplay, Chemical Assistant to the Chief Engineer of the Gas Light and Coke Company. The cause of death was heart failure following a very brief attack of influenza.

The following is taken from the current issue of the "Co-Partners' Magazine" of the Gas Light and Coke Company:

Mr. Taplay had served the Company for nearly thirty-six years. Working originally under the late Mr. Greville Williams, F.R.S., who was then in charge of the arrangements for testing the Company's gas, Mr. Taplay succeeded him in these duties and continued in this position until his death. His energies, however, were not limited to the normal routine work of his office, and he devised a number of instruments of a photometric and chemical nature, and among others may be instanced instruments for the analysis of illuminating gas; for determining sulphur in commercial benzole, petroleum, naphtha, &c.; for determining the enrichment value of benzole, petroleum, naphtha, &c.; and also an apparatus and improved method of determining the constituents of coal, coke, "Coalite," "Carbo," &c.

He also made original researches into the production of sulphuretted hydrogen in the water of gasholder tanks by bacteria, and embodied the outcome of his work in a report to the Chief Engineer in 1905.

Among the many reports he made may be mentioned one on the photometric work in connection with the lighting investigation carried out by Dr. Rideal in 1907; also a report on the comparison of coal and "Carbo" for radiant heat, and products of incomplete combustion when burned in a domestic fire grate.

As Chemist to the "Life of Gas Meters Joint Committee" of the Institution of Gas Engineers, Mr. Taplay was actively associated with Mr. W. B. Parkinson in the researches into this highly important matter to the Gas Industry. He read a paper at the Institution of Gas Engineers meeting in 1921 on external corrosion of mains and services, a subject on which, from his own investigations, he was well qualified to speak.

His death at a comparatively early age terminated a very active career, spent in the performance of duties which he was so well fitted to carry out, and has removed from the Company's Staff a most valuable servant.

There died at Giffnock, Glasgow, on March 6, ISABELLA CLARK KENNEDY CARMICHAEL, widow of Mr. James W. Carmichael. Mr. Carmichael was for many years Engineer and Manager to the Barrhead Gas Company, and was well known among, and much respected by, the older generation of gas engineers. Mrs. Carmichael, who outlived her late husband by almost ten years, had been in failing health for some time, and passed away peacefully as the result of a heart attack. A woman of high character and considerable personality, her loss is mourned by a family of four sons and one daughter. Two of her sons are engaged in the Gas Industry, the eldest, Mr. Thomas Carmichael, being Engineer and General Manager to the Portsmouth Gas Company, while a younger son is Assistant Manager at the Barrhead Gas-Works. Much sympathy will be felt with the family in their sad bereavement.

Following a brief illness, Mr. W. H. ADAMS died at his home, Sedgley, on Wednesday last. Mr. Adams, who was in his 62nd year, had been Engineer, Manager, and Secretary of the Bilston Gas Light and Coke Company since 1906, a member and Past-President of the Midland Association of Gas Engineers and Managers, a member of Bilston Rotary Club, and a member of the Murdoch Lodge of Freemasons. For several years Mr. Adams was connected closely with the public life of Bilston. He was a member of the Bilston Urban Council from 1913 to 1920, and for five years in that period he was Chairman of the Education Committee. Deceased leaves a widow, one son, and one daughter.

British Commercial Gas Association.

Yorkshire District Conference at Halifax, March 26, 1931.

The following programme has been arranged for this conference:

MORNING SESSION

In the Council Chamber, Town Hall, Halifax, at 10 a.m.

Civic Welcome by His Worship The Mayor, Ald. J. Carter, J.P.

CONFERENCE.

Chairman . . . . Ald. J. H. Waddington, J.P., Chairman, Halifax Gas Committee.

Advertising interlude by L. Denham, Halifax.

Speakers:

Mr. C. S. Shapley, M.I.Mech.E., M.Inst.Gas E. . . .	Leeds
Mr. H. E. Bloor, B.Sc., B.Eng., M.Inst.Gas E. . . .	York
Mr. F. H. Robinson, Assoc.M.Inst.C.E., M.Inst.Gas E. .	Harrogate
Mr. R. Halkett, M Inst.Gas E.	Sheffield
Mr. T. R. Cook, M.Inst.Gas E.	Rotherham
Mr. J. E. Lister Cooper, M.Inst.Gas E.	Yeadon
Mr. E. J. Sutcliffe, M.Inst.Gas E.	Bradford

Discussion opened by

Mr. R. Watson, M.Inst.Gas E. . . . . Doncaster

Adjournment at 12.30 p.m.

Luncheon 12.45 for 1 p.m. at the Alexandra Hall.

AFTERNOON SESSION

In the Alexandra Theatre at 2.30 p.m.

Chairman . . . . Ald. J. H. Waddington, J.P., Chairman, Halifax Gas Committee.

Supported by Sir Francis Goodenough, C.B.E., Executive Chairman of the B.C.G.A.; Ald. Will Melland, J.P., Chairman National Smoke Abatement Society; Ald. A. W. Longbottom, J.P., M.P.; Mr. Arthur Hayday, M.P.; and Members of the Halifax Gas Committee.

Addresses to be delivered by Sir Francis Goodenough, C.B.E.; Mr. Arthur Hayday, M.P.; Ald. Will Melland, J.P.; Dr. G. C. F. Roe, L.R.C.P. & S., L.M., D.P.H., D.P.M., Medical Officer of Health, Halifax.

To be followed by a discussion, in which Mr. Arnold Marsh, General Secretary, National Smoke Abatement Society, and Mr. J. W. Beaumont, M.R.S.I., Chief Sanitary Inspector for Halifax, will take part.

Afternoon tea, Balcony, Alexandra Hall, 4.30 p.m.

Forthcoming Engagements.

[*Secretaries of Gas and Kindred Organizations are asked to assist in making this diary of events as complete and useful as possible by sending the earliest intimation of all meetings.*]

March 19.—SOCIETY OF BRITISH GAS INDUSTRIES.—Council Meeting in the afternoon.

March 19.—SOUTHERN ASSOCIATION OF GAS ENGINEERS AND MANAGERS.—Annual General Meeting at the Hotel Metropole, Northumberland Avenue, W.C., at 2.15 p.m.

March 20.—LONDON AND SOUTHERN DISTRICT JUNIOR GAS ASSOCIATION.—Paper by Mr. J. G. Clark on "Gas Lighting."

March 21.—SCOTTISH JUNIOR GAS ASSOCIATION (WESTERN DISTRICT).—Annual Social. Address by Mr. R. E. Gibson, Vice-President of the Institution of Gas Engineers.

March 21.—WALES AND MONMOUTHSHIRE JUNIOR GAS ASSOCIATION.—Visit to Tredegar. Paper by Mr. D. W. Davies, Engineer and Manager to the Tredegar Gas Undertaking.

March 24.—SOUTHERN ASSOCIATION OF GAS ENGINEERS AND MANAGERS (EASTERN DISTRICT).—Meeting at 28, Grosvenor Gardens, S.W. 1.

March 26.—B.C.G.A. YORKSHIRE DISTRICT CONFERENCE at Halifax.—Alderman J. H. Waddington, J.P., presiding.

April 10.—NORTH BRITISH ASSOCIATION OF GAS MANAGERS.—Spring Meeting at Falkirk.

May 14 and 15.—EASTERN COUNTIES GAS MANAGERS' ASSOCIATION.—Spring Meeting at Wisbech.

May 21.—WALES AND MONMOUTHSHIRE DISTRICT INSTITUTION.—Meeting at Cardiff.

May 22.—SOCIETY OF BRITISH GAS INDUSTRIES.—Annual General Meeting in London, under the Presidency of the Right Hon. Lord Eustace Percy, M.P.

June 2-4.—INSTITUTION OF GAS ENGINEERS.—London Conference.

June 30.—NATIONAL GAS COUNCIL.—Thirteenth Annual General Meeting.

Oct. 27-28.—INSTITUTION OF GAS ENGINEERS.—Autumnal Research Meeting.

CORRESPONDENCE

Protest Against Unfair Boosting

SIR,—At the Annual Meeting of the National Joint Industrial Council for the Gas Industry, held on March 11, it was reported that numerous protests had been received from district organizations of both employers and workers against the recent activities and statements of a Minister of the Crown; and the following resolution was unanimously passed :

> That this Joint Industrial Council desires to enter a most emphatic protest against the carrying on by any Minister of the Crown of propaganda in favour of a particular industry, on the ground that such a course is not only unconstitutional, but is most detrimental to other competing industries.

This resolution represents the views not only of the employers, but of 113,000 workers directly engaged in the production and supply of gas to nearly 10,000,000 consumers.

(Sgd.) D. MILNE-WATSON, Chairman.
(Sgd.) WILL THORNE, Vice-Chairman.
(Sgd.) W. J. SMITH,
Joint Secretary, Employers' Side.
(Sgd.) ARTHUR HAYDAY,
Joint Secretary, Workers' Side.

National Joint Industrial Council for the Gas Industry,
28, Grosvenor Gardens, S.W. 1,
March 16, 1931.

Gas Switches

SIR,—Possibly the following may be of interest to the members of the gas profession, particularly those who are finding competition very keen in the lighting load.

I have this morning visited a public house where we have fitted every room with gas switches—thirteen in all. In two of the bedrooms there are two two-way switches enabling the occupier of the room to turn on the gas when entering, and to turn it off after getting into bed.

In a talk with mine hostess this morning, I was assured that switch lighting by gas was arousing the greatest curiosity among her customers. This curiosity has already been reflected in a considerable number of orders from that immediate district. I may add that the district is very scattered, being almost rural in character.

The landlady informed me that customers, on going into the house, frequently commented that electricity had been installed; and on its being pointed out that the switches were for gas, the statement was received with a great deal of incredulity. I am wondering whether this is the first licensed house to be fitted throughout with gas switches.

The switches are of the Horstmann Gear Company's manufacture, of which we have something like 5000 in use within our area.

" MODERN."

March 16, 1931.

THE NEWS OF THE WEEK

Whitfield Gas Producers, Ltd., of Grosvenor Mansions, 82, Victoria Street, S.W. 1, has been registered as a private Company, with a nominal capital of £10,000, to carry on a business as gas engineers, boiler-makers, water-heater makers, &c.

Messrs. Alldays & Onions, Ltd., of Great Western Works, Small Heath, Birmingham, have purchased from the liquidator the whole of the goodwill, patents, patterns, and drawings connected with the foundry equipment business of the Britannia Foundry Company, of Coventry. This, of course, includes a full range of Britannia moulding machines.

Woodall House is in Occupation, we learn from the Tottenham and District Gas Company. Mention that the staff would shortly be moving into their new premises was made by the Chairman at the annual meeting of the Company. The address, therefore, is now: Woodall House, 658, Lordship Lane, Wood Green, N. 22, while the telephone number (Tottenham 2626) remains the same.

Messrs. Hailwood & Ackroyd Inform Us that they had have one of their sample cars in London stolen three times during the last few months, the last occasion being on March 10, when it was stolen in Leytonstone and recovered by the police at Bethnal Green with the whole of the contents stolen. The contents consisted of " Hailware " decorated shades and globes, and from the persistence with which their car is stolen and the contents removed the firm only take it that thieves appreciate their British-made glassware, and are taking the chance of fitting up their homes at a cheap rate.

A Net Profit of £28,825 is reported on the Gas Undertaking by the Warrington Borough Treasurer after providing £2500 for retort renewals. This sum was carried to the appropriation account. There was £11,252 standing to the credit of the sinking fund on March 31, 1930. Within the Borough the net price charged for gas during the first half-year was 10·21d. per therm, the equivalent of 4s. per 1000 c.ft., and for the second half-year 8·936d. per therm, which represents a reduction of 6d. per 1000 c.ft. An additional charge is made for outside districts of 0·64d. per therm, equal to 3d. per mile per 1000 c.ft.

Midland Section of N.G.C. at Birmingham.

Visit to Industrial Research Laboratories.

On the invitation of the City of Birmingham Gas Committee, about fifty members of the District Executive Board, Midlands Section of the National Gas Council, visited the Industrial Research Laboratories of the Birmingham Gas Department on March 5.

The members were received in the Gas Offices at the Council House by Alderman J. H. Lloyd, Chairman of the Birmingham Gas Committee, Mr. E. B. Tomlinson, Chief Engineer, together with Dr. C. M. Walter, Engineer-in-Charge of the Research Laboratories, Birmingham Gas Department, and members of his staff. Mr. A. W. Smith, the General Manager and Secretary—by whose courtesy the visit had been arranged—was unable to be present as he had to attend a meeting, in London, of the Gas Legislation Committee recently set up by the Board of Trade.

Alderman Lloyd addressed the gathering, welcoming the delegates to Birmingham on behalf of the Birmingham Gas Committee. He said they were glad to have the opportunity of showing to so many interested gas engineers the work which was being carried out at the Birmingham Industrial Research Laboratories with a view to the development of the industrial gas load in Birmingham, and also the services which were extended to manufacturers, both in Birmingham and in all parts of the country, in connection with physical and metallurgical testing and the carrying-out of heat treatment work, all of which were provided for in the activities of the Research Laboratories.

The party were divided into two groups, the first group proceeding to the Industrial Heating Section and Demonstration Rooms situated in Edmund Street, and inspecting the various large and small furnaces and industrial apparatus available to manufacturers in the centre of the city, also including the Chemical Laboratories attached to the Research Laboratories, in their visit.

The second group visited the Physical and Mechanical Testing Laboratories at the Council House, and were shown the various types of tests which were that day being carried out.

After lunch the whole party were conveyed from the

THE NEWS—*continued.*

Council House to the Heat Treatment Section of the Laboratories, situated at the Windsor Street Gas-Works, where the gas furnace plant installations, and the work at that time being carried out on the furnaces, were fully inspected.

After this, the party were conveyed to the works of the Moss Gear Company, Ltd., where the gas furnace installation in the hardening shops, and the works generally, were inspected under the guidance of Messrs. Walter and Arthur Duckett, two of the Managing Directors of the Company.

The visitors then returned to the Council House, Birmingham, where tea was provided at the invitation of the Birmingham Gas Committee. Councillor Giles, Chairman of the Burton-on-Trent Gas Department, proposed a vote of thanks to the Birmingham Gas Committee, Mr. A. W. Smith, Dr. Walter, and the members of his Staff for the arrangements which had been made for the various visits during the day. The vote of thanks was seconded by Mr. Clift, Chairman of the Redditch Gas Company, and replied to by Alderman Lloyd on behalf of the Birmingham Gas Smith, Dr. Walter, and the membesr of his Staff for the seconder for the vote of thanks, on behalf of himself and the staff of the Industrial Research Laboratories. He gave some further details in connection with the installation of furnaces at the Moss Gear Company's Works, which he thought would be of interest to the gathering.

Better Lighting on Blackheath Common.

As a result of instructions from the Minister of Transport, special observations are being made on Blackheath Common in regard to the lighting, following a protest by Sir Kingsley Wood concerning the number of accidents occurring there at night.

One-way traffic is now in operation at Camomile Bottom in the centre of the common, and directional gas-lamps of a new type which warn approaching motorists to turn left have just been placed at the cross-roads. The yellow rays shed by beacons fitted above the directional signs may be seen at nearly a mile's distance.

Local residents are still dissatisfied with the scarcity of lamps on the common, and are urging that additional lighting should be installed.

Photography in Industry and Commerce.

It is not inappropriate that, in an issue of the "JOURNAL" immediately following one in which mention was specifically made of films being shown to a Gas Association of industrial processes by a well-known firm in the Industry, we are able to draw attention to a new publication by Messrs. Kodak, Ltd., entitled "Photography in Industry and Commerce."

It is proposed to publish this magazine quarterly (No. 2 will appear early in June), and its object is to provide a review of the services which photography is rendering to industry and commerce. Photography is one of the greatest and most widely useful powers put into the hands of industrialists and business men by modern science, and the problems of applying photography to the particular requirements of various businesses and the solution of any technical difficulties which may arise in so doing are to be the concern of Messrs. Kodak's Service Department.

The science of micro-photography—that is, photography *plus* the microscope—is already applied to some extent in the Gas Industry, particularly in the research departments, where the examination of metals for pipes and of other substances is carried to a great degree of perfection. This subject is also dealt with by "P.I.C."

Then again photography could be utilized with considerable advantage by the sales side of the industry. It is claimed that the new portable cinematography is one of the most powerful and economic sales aids available to-day. Its possibilities are endless, and no doubt many of our selling staffs have already proved its value. Factory processes can be shown, while it is also suggested that special films can be shown in display windows by means of the "Kodascope," the programme being changed periodically.

There are unlimited possibilities, too, for the instruction of staffs, while the "Cine-Kodak" is now a recognized part of the equipment of many laboratories; and, in addition, films of processes are taken as permanent records to yield data for future developments.

In short, as the magazine states, the most powerful force in printed salesmanship to-day is the illustration, and the most powerful type of illustration is the photograph. The camera cannot lie; a photographic illustration must be taken as accurate. Pictures can tell more in a single page than can words in a whole chapter. They convey a vivid, clean-cut idea. Messrs. Kodak, Ltd., are making it their business to know how good sales photographs can be produced and the sources from which they can be obtained, and they invite inquiries on any photographic matters.

Contemplated West Country Amalgamation.

Weston-super-Mare and Burnham.

During the course of the recent Annual General Meeting of the Burnham-on-Sea Gas Company, mention was made of a contemplated amalgamation with the Weston-super-Mare Gaslight Company.

The Chairman remarked that during the past year the Directors had had conversations with the Weston-super-Mare Gaslight Company, and, after thorough examination of the many considerations involved, preliminary agreements were nearly completed by the Boards of the Companies by which an amalgamation of the Companies was proposed.

The proposal will be considered at an extraordinary general meeting of shareholders of the Burnham Company to be convened later, when a draft provisional order for the Board of Trade will be submitted for approval.

Generally, the terms are these: Burnham shareholders will be able to exchange their holding for the ordinary 5 p.ct. maximum stock of the Weston-super-Mare Company, with the option of an alternative cash payment if desired. The employees of the Burnham Company will be taken over and guaranteed employment for a minimum period of two years, with compensation for older employees who may be displaced thereafter. A Director from Burnham will be elected to the Weston Board to safeguard Burnham interests.

Cannock to Absorb Brownhills Company.

The Cannock, Hednesford, and District Gas Company is applying to the Board of Trade for authority to take over the undertaking of the Ogley Hay and Brownhills Gas Company. Both concerns operate in Staffordshire. The Cannock was formed in 1897 by an amalgamation of the Cannock District Gas-Light Company and the Hednesford Gas Company, and has a capital of £80,000, of which £59,000 has been issued. The dividend paid last year was 8 p.ct. The Brownhills Company dates from 1869, and has a capital of £24,700, of which £14,700 has been issued. The purchase consideration is to be satisfied in shares or stock of the Cannock Company.

The latter has already power to supply Cannock, Hednesford, Gentleshaw, Longdon, Norton Canes, Great Wyrley, and Cheslyn Hay; and the acquisition of the Brownhills Company will add Ogley Hay and Brownhills to the area. In addition, the Cannock Company, in its enlarged form, is asking for sanction to operate in Featherstone and Hilton and in parts of the parishes of Teddesley Hay, Essington, Aldridge, Shenstone, Farewell, and Chorley. This will necessitate the raising of further share and loan capital in the near future.

Gas and Spring Cleaning.

The "Liverpool Post and Mercury" of March 16 devoted a valuable article to the various merits of gas and electricity for heating, lighting, and labour saving at this spring-cleaning time. Having dealt with electricity as "a friend of housewives," it was stated that the claims of gas are fully as strong and insistent.

This source of light and heat, the article continued, has, indeed, peculiar merits which make a particularly powerful appeal to housewives when, as now, the time for "turning out the house" approaches.

For instance, the provision of hot meals during the busy spring-cleaning period is a problem that is readily solved by means of a gas cooker, the automatic oven-heat regulator being especially useful at such times as these.

When the kitchen is being re-decorated is a good time for the installation of one of the latest all-enamelled gas cookers. They are handsome pieces of kitchen furniture, looking as efficient as, in fact, they are, and a woman is proud to have the management of such a machine.

Not less important than the prompt and satisfactory provisioning of busy workers who have no time to waste, is the availability of a plentiful supply of hot water; and

it is remarked that this may be secured very effectively by the use of an independent coke boiler, which, incidentally, is also useful for cremating household rubbish. It can be lighted by means of a gas poker.

The value of gas for heating was also indicated in the article, as instanced by the fact that where a house is fitted with gas fires, and gas is used for cooking and water-heating, the spring-cleaning can be done early in the year, for, when there are no chimneys to be swept there is no question of waiting till the fires are no longer needed before tackling the work.

Finally, it was emphasized that this is the time for modernizing the household gas fittings. Rooms may be given the finishing touch by means of artistic pendants, with bowl fittings, the value of gas switches in this connection being also indicated—a convenience thus no longer the peculiar attraction of electric current.

Barry Gas-Works Project.

The Barry Council have decided to apply to the Unemployment Grants Committee for approval of the gas-works development scheme involving an expenditure of £133,300, with an additional £9997 for engineering and contingencies. It was reported in the minutes that the Council had conferred with Mr. A. Valon, M.Inst.C.E., who had investigated the existing undertaking.

Details of the scheme suggested are: Carbonizing plant of two million c.ft. per day capacity, including coal and coke elevating and conveying plant, waste-heat boiler, coke screening plant, bunkers, pan-ash washer, and accessories, £52,000; sidings, weigh-bridge and houses, £2950; gasholder, &c., £33,600; and other items making the total stated.

Annual Dinner of Bristol Gas Company Staff.

At the Annual Dinner of the Bristol Gas Company nearly 200 officials, foremen, and departmental inspectors were present. Sir George E. Davies, J.P., the Chairman of the Company, presided and was supported by Alderman J. Fuller Eberle (Vice-Chairman), and other Directors, Mr. S. E. Halliwell, Secretary and Commercial Manager, and Mr. R. Robertson, Chief Engineer and Works Manager.

Mr. Halliwell submitted "The Bristol Gas Company," which was responded to by the Chairman, who referred to the remarkable progress of the Company and the very satisfactory relationships existing between the various departments. This was very gratifying and augured well for the future success of the Company. Alderman Eberle, Mr. Boucher, and Mr. Cowlin responded.

Sir George E. Davies proposed "The Staff and Foremen," which was responded to by Mr. Halliwell and Mr. Robertson.

The toast to "The Chairman," proposed by Mr. Halliwell, was received enthusiastically, and Sir George E. Davies, in replying, expressed appreciation of the services of the artistes.

It was a most successful social evening, the most cordial feelings characterizing the whole proceedings.

Bournemouth Co-Partnership Meeting.

Speaking at the Annual Meeting of the co-partners of the Bournemouth Gas and Water Company, held at the Bournemouth Town Hall, on March 6, Mr. William Cash, the Chairman of Directors, said he saw no reason why gas companies should not go on prospering, notwithstanding what was said about their rival—electricity—and the fact that it was thought to be essential by people in high places to urge that electricity must be used on all possible occasions.

Mr. Cash was moving the adoption of the report and balance-sheet for the year ended Dec. 31, 1930. The report showed that the bonus credited to co-partners, calculated at the rate of 9 p.ct., as in 1929, was £10,616, which went to the accounts of 698 members. Approximately 150 shares are to be transferred to co-partners whose accounts entitle them to shares at £13 per share, a little below market value. During the period from 1908 the total shares transferred to co-partners have been 2927, representing a total value of £38,600. The balance-sheet showed £194,042 standing to the credit of the pension fund, and its investments are all in first-class securities estimated to be worth, at the end of December last, £8000 more than they had cost. The amount contributed by co-partners to the pensions fund last year was £3898, and the Company contributed a like amount. For several years now the Company have made an annual grant of £10,000 in order to get the fund on a sound actuarial basis, as a result of which it is now solvent.

Mr. Cash urged the co-partners to use the scheme as a real savings fund and not to withdraw their money unless it was absolutely necessary, but to allow it to remain for the purchase of stock in the Company. That was really the object of co-partnership—not merely to share in the profits, but to become holders of stock.

With regard to output, they were comparing with an abnormal year in 1929; but notwithstanding that they had an increase in 1930 over 1929. The increase for the two years put together was two-hundred-and-two million c.ft., or 9 p.ct. for the two years.

The report and balance-sheet were adopted.

A hearty welcome was extended to Col. Woodall, the former Engineer and General Manager and now a Director of the Company. Among a number of those who received medals for 25 years' service with the Company was Mr. P. G. G. Moon, the Engineer and General Manager, whom Mr. Cash thanked warmly for his services to the Company.

Proposing a vote of thanks to Mr. Cash for presiding, Mr. Moon said the whole secret of the Company's success was its human side, built up so largely by the Chief they all loved—Col. Woodall—and liberally interpreted by the Directors. It was that which made them feel they were not mere servants, mere day workers, but people truly interested in the Industry they served.

Notes from Scotland.

Bridge of Allan Rebates.

The Bridge of Allan Gas Committee have agreed that rebates to large consumers should be as follows: Not less than 250,000 c.ft. for all purposes, 2½ p.ct. on the first 250,000 and a similar rebate on any gas consumed between 250,000 and 500,000; to consumers of 500,000 c.ft. a rebate of 2½ p.ct. on the first 250,000, 5 p.ct. on the second 250,000, and 10 p.ct. on any consumption beyond 500,000 c.ft. These rebates will take effect as from May 15, 1930.

Serious Competition from Crude Oil Engines has been brought to the notice of the Elgin Town Council in connection with the Gas Undertaking. The Gas Engineer and Manager (Mr. P. Low) stated that local users of gas for power and industrial purposes were considering the adoption of crude oil engines from economic motives. It was finally decided to reduce the price of gas by 10d. to 2s. 6d. per 1000 c.ft.

Co-ordination of Iron and Steel Specifications.

The Iron and Steel Industry Committee which was appointed by the Council of the British Engineering Standards Association at the end of last year to consider the question of the co-ordination of the iron and steel specifications has now commenced work. At a recent meeting, the manufacturers' representatives stated that during the past year the industry had been asked to work to no less than 250 separate specifications, many of them varying from one another in only minor and unimportant details. That this multiplicity of specifications adds enormously to the cost of production cannot be too strongly emphasized.

A small Committee representative of the various branches of the iron and steel industry has now been set up to review existing specifications, both British Standard and others, in the hope of being able to put forward recommendations for simplifying and so improving this most unsatisfactory position. The Committee will naturally keep in mind the fact that particular circumstances may distinctly warrant the framing of particular requirements. On the other hand there can be no justification for the present chaotic conditions, and the sooner some measure of co-ordination is effected, the better it will be for both the using as well as the producing interests.

It is hoped that the users generally, recognizing the economic value of this endeavour, will support the efforts of the Committee, which will be directed to covering the present legitimate requirements of users by the minimum number of specifications.

NOTES ON NEW BOOKS

CONSTRUCTIONAL MATERIALS AND CORROSION.*

This is indeed a monumental work, and it is no matter for surprise that the author should have found it necessary to devote five years to surveying the scattered literature of the subject. Evidence of the ravages caused by corrosion is always at hand, but the sum total of the metal lost thereby is truly amazing. The world production of metals from 1890 to 1923 was 1766 million tons, and in the same period no less than 718 million tons were lost by rusting or otherwise. It has been calculated that in the American petroleum industry the annual losses due to corrosion represent 10 p.ct. of the invested capital. These figures emphasize the need for an adequate knowledge of the conditions under which the various metals, alloys, and other constructional materials may be used. Such knowledge can be gained from a study of the theoretical aspects of corrosion and from *ad hoc* experiments on the influence of corrosive substances on the materials concerned under a wide range of conditions, such as varying temperature and varying concentration. Plant experience, too, adds much useful information, for in many cases the effects of erosion are even more serious than are those of corrosion. The presence of impurities, sometimes in minute amount, may have an important effect in multiplying corrosive action many times, and the nature of the surface also plays a part. Lack of uniformity of the metal and effects of heat treatment and working have also to be considered. In many cases, also, protective films may be formed under some conditions but not under others, or protective films present on the original surface may be worn away or dissolved or the metal may assume a passive state. The selection of a suitable material for a specific use is often a difficult problem, and the final choice is often the result of a compromise between capital cost and maintenance cost. On the other hand, instances are not rare in which corrosion *per se* is not the chief cause of anxiety, but rather the need for avoiding contamination of the product by the dissolved metal.

The chemical engineer is nowadays in a much more fortunate position than that of his predecessors in view of the many discoveries which have been made in the search for means of counteracting corrosive influences. Among these may be mentioned the discovery of corrosion resisting ferrous alloys, anodic oxidation, autogenous welding of many metals, metal spraying, improvements in electrodeposition, and better solders. Chemical industry is always on the look-out for new materials capable of production on a large scale, and a material hitherto available only by the ounce may be made by the ton if its use promises successful results. The rarest metals find applications in appropriate spheres. Silver, nowadays, is fast losing its position as a precious metal, and in view of its present low price will undoubtedly come into much more extended use as a constructional material.

In his treatment of the subject, the author has been very systematic and has divided his materials into two classes, metals and non-metals being described in two separate volumes. The first portion of the first volume discusses the various theories of corrosion very fully, and is followed by sections devoted to each metal in turn. The chief alloys of each metal are dealt with after the section devoted to that metal. In many cases, the corrosion resisting properties of a metal are not the only factor involved, and a knowledge of such physical properties as melting point, coefficient of expansion, hardness, ultimate strength, thermal conductivity, and specific heat is required. The author has therefore dealt very fully with the physical properties of the various metals and alloys. Furthermore, it is often the case that the metals are employed as coatings, and the properties of such coatings may differ from those of the metal in the more massive state. For this reason, information as to the behaviour of coatings produced in different ways is also given.

Non-metallic materials are discussed under the headings actual constructional materials (glass, wood, ceramic products, artificial resins, synthetic stone, cement, and concrete, including reinforced concrete, natural stone, fused silica, and prodorite) and coatings, cements, and accessory materials (enamels and other protective coatings, paints and varnishes, asbestos, tar and bitumen, rubber and ebonite, cements for joining metal to metal, metal to ceramic materials, &c., carbon, leather, paper, vulcanized fibre, paraffin, oils, fats and waxes, celluloid, &c., sulphur and textiles).

A subject of particular importance to the Gas Industry is that of refractories; hence it is not inappropriate to survey the very adequate chapter in which these materials are included—namely, that entitled "Ceramic Products," which includes 52 pages and an appended bibliography containing 471 references and extending to 15 pages. It contains 28 illustrations. The subject matter is as follows: Building bricks, corrosion of building bricks, refractories, physical properties, determination of specific gravity and porosity, structure, refractoriness with and without load, thermal conductivity, specific heat, thermal expansion, electrical resistance, crushing strength, permeability, refractory cements, firebricks, silica, Dinas, bauxite, magnesite, carbon, graphite and carborundum bricks, corrosion of refractories, testing for slagging action, refractories in inorganic industries, the glass industry, the ceramic industry, limekilns, boiler furnaces, electric furnaces, water gas generators, kilns, coke-oven plant, gas-works and metallurgical operations, and, finally, refractory coatings. The information is very up-to-date, references being given, for example, to the properties of magnesidon bricks. There are numerous tables giving, for each property considered, the values for a wide variety of materials.

As regards metals, too, the gas technologist may rightly expect to find much useful information, nor will he be disappointed. The Gas Industry bristles with corrosion problems, for in it are to be encountered acid and alkaline liquors, sulphur and cyanogen compounds, tar and ammonia, to name but a few of the harmful materials, the danger being increased by the prevailing temperatures in many cases. In seeking help in their problems, the engineer and chemist will find that the author has planned the index on very happy lines. Thus, in the volume devoted to metals, under tar will be found references to its action on aluminium, iron and zinc, under sulphuretted hydrogen to almost all of the metals, and under prussic acid to aluminium, lead, iron, gold, nickel, platinum, and zinc. In many cases, the references are to alloys as well as to the commercial metals.

The work contains no less than 10,000 references to original articles, each chapter being followed by its own bibliography. In the section devoted to iron and iron alloys alone, there are 2871 references. Naturally, it was not possible to give a summary of all of these papers, but the numbered references in the text indicate which papers are relevant in connection with any point about which information may be desired. In such a large list, containing, as it does, the names of investigators in nearly all the countries of the world, it is not surprising to find that some of the names have been rendered incorrectly. Some of the titles of the papers, too, are a little faulty—*e.g.*, a paper on "Refractories in the *Gas* Industry" appears in the guise "Schwer schmelzbare Baustoffe in der *Glas*industrie." The text, also, is not free from errors, this being understandable in view of the very large number of numerical data. It seems likely that the author has not always consulted the original sources of the information and may have been led astray by a faulty abstract or a misquotation in a text-book or work of reference. Thus the true specific gravity of carbon bricks is given as 3 and the silica and alumina contents of Sheffield ganister are given as 4·6 and 93·1 p.ct. respectively.

The publishers deserve great credit for the liberality with which they have permitted the author to include illustrations and diagrams, of which there are upwards of 500. Some of the curves are of extraordinary value by reason of the concise information which they convey.

In a review of a work of this kind, detailed references to isolated pieces of information would be out of place. Sufficient has, however, been said to indicate that the book will prove a valuable guide in constructional chemical engineering and an equally valuable help where difficult corrosion problems have to be faced and solved.

* "Werkstoffe und Korrosion," by E. Rabald. Leipzig, 1931, Otto Spamer, 2 volumes, pp. xxii. + 976 and x. + 392. Price RM.128 unbound, RM.135 bound.

TECHNICAL GAS ANALYSIS.*

This little book contains a wealth of useful information and may with advantage be read by all concerned with gas analysis. The author, who is a member of the liquefaction

* "Gasanalyse in der Technik," by P. Schuftan. Leipzig, 1931, S. Hirzel. Pp. 80. Price RM. 5.50.

of gases division of the Linde Company, is an authority on gas analysis and has written a section on the subject in the new edition of Engler-Hofer's standard work on petroleum. It was a happy inspiration of the publishers to reprint this section in separate form and thus render it available at a very low cost to the wider circle of chemists interested in gas analysis but not connected with the petroleum industry.

By assuming that his readers have already a working knowledge of the subject, the author is able to be more concise than would have been the case if no such assumption had been made.

A very useful description is given of the sources of error encountered in gas analysis due to fluctuations in temperature and pressure, absorption of other gases than the one being determined in a particular absorption, evolution of gases from the reagents, limitations of accuracy due to the graduations of the measuring vessel, effect of dead space, dirty apparatus, and deviations from the gas laws. Methods involving explosion and combustion over copper oxide and platinum are described as are also physical methods based on refractive index and thermal conductivity. The determination of density and calorific value is also described.

A later section is devoted to the individual gases and describes methods available for the detection of the gases and their determination in small and in large concentrations. The determination of the purity of highly concentrated gases is also described. Ample references to the modern literature of the subject are given.

Among useful " tips " given by the author may be mentioned the use of dilute hydrofluoric acid in place of bichromate mixture for cleaning measuring tubes, the insertion of a length of platinum wire in the copper oxide tube to serve as a catalyst, and the avoidance of formation of nitric oxide in explosion methods by carrying out the combustion in stages, the gas being added little by little to the oxygen or air so that combustion always occurs at a concentration in the neighbourhood of the lower-limit mixture. The use of the " Gaswippe " for the determination of the density of small amounts of gas is also explained.

Special attention is given to the unsaturated constituents of gases and their determination by fractional absorption. For determination of the higher paraffins present in gases, the author advocates treatment of the gas with activated charcoal. Thereby these constituents are adsorbed and may subsequently be liberated and recovered in concentrated form so that enhanced accuracy is achieved.

Continental Notes.

DETERMINATION OF TAR FOG IN GAS BY USE OF SINTERED GLASS FILTERS.

H. Brückner in " Das Gas- und Wasserfach," 1931, 74, 183-4 (Feb. 21), describes the use of glass filters with sintered glass diaphragms for the determination of tar fog.

The conventional method is to employ a filter-tube packed with degreased cotton-wool to catch the tar fog and dust. The former is then determined by extraction with carbon disulphide or the combined dust and tar fog may be estimated with sufficient accuracy for routine purposes by drying the tube to approximately constant weight at 90°-100° C. in a current of air. The error due to volatilization of some of the tar may be minimized by drying at a temperature of 50°-60° C. in a current of air dried by passage over calcium chloride. Filters of cotton wool are not uniformly packed, and the gas takes the path of least resistance so that complete absorption of the tar may not be realized.

A uniform filtering surface is provided by a filter tube containing two parallel discs of sintered glass. The tube has the shape of a reduction tube, the diaphragms being fused into the wide central portion. At the junction between the inlet limb and the central portion is a constriction. In the inlet end is packed cotton wool to a length of 1¼-1½ in., and this serves to catch the dust and coarser tar particles. The second diaphragm serves as an indicator that absorption has been complete, since in that case it would not be stained.

Gas is passed through the filter for 20-24 hours at a rate up to 3 or 4 c.ft. per hour according as the concentration of tar fog exceeds or falls short of 2 grains per 100 c.ft. A filter-pump may be used, if necessary, to suck the gas through the tube. If the concentration of tar fog exceeds 4 grains per 100 c.ft., which, however, should not be the case if cooling has been properly carried out, the gas must be throttled by means of a tap, and its rate cut down to a value not exceeding 1½ c.ft. per hour.

The filter is dried for 2 hours at 105°-110° C. before the test and is cooled in a desiccator before being weighed. After the test, the tube is dried at 50°-60° C. to approximately constant weight (3-4 hours), air dried over calcium chloride being passed through at the rate of ½ c.ft. per hour.

The tube is cleaned, after removal of the cotton-wool, either with sulphuric acid-bichromate mixture or benzene, and finally with pyridine, carbon tetrachloride, or carbon disulphide until the diaphragms are again white.

GAS SERVICE - - -

Discussed from the viewpoint of the Gas Salesman.

Order To-Day—Fixed To-Morrow.

Fortunate is the gas undertaking which is in a position to advertise thus. It is common to all of us that, when we have set our hearts on anything and bought or ordered it, nothing is more irritating than delay in delivery. But the undertaking which can take advantage of the vagaries in our British weather has a very big pull, apart from this. For instance, in the recent very cold spell the Newcastle and Gateshead Gas Company were able to proclaim in the local Press that " there's nothing can give you comfort so easily and quickly as a gas fire. Order to-day—fixed to-morrow in your home." The objection of the ultra-cautious man who would think that, even so, he would only want his fire for a few days, was met in advance by " no charge made for hire from April to September."

If Winter Comes.

Just as surely as cold snaps occur every winter, so also will the papers, before many months are past, be recording heat-wave scenes. We swelter at least once every year even in the worst English summer. Who will be ready to offer refrigerators—ordered to-day, fixed to-morrow? Heavy stock to carry, no doubt, but well worth thinking about in good time. We are not implying that refrigeration should be sold only as a hot-weather load. It is undoubtedly an all-weather load, as has repeatedly been urged in our columns. But by far the easiest opening for the thin end of the wedge is a hot spell. The average man takes his hot weather very badly when it does come, however much he sighs for it in advance.

Coke Does Not Compete with Gas.

Mr. F. H. Arms, of the Birmingham Gas Department, recently faced the Midlands District Salesmen's Circle on the subject of Gas Coke as a Domestic Fuel. We say " faced " advisedly, because, when coke sales are discussed by gas salesmen, it seems inevitable that someone shall raise the point that, if coke sales are pushed, it must be to some extent to the detriment of gas sales. As usual, the point cropped up on this occasion, and in reply Mr. Arms affirmed that the object of his paper was not in any way to bring coke into competition with gas, but to emphasize the fact to gas salesmen that coke provides them with an " open sesame " in regard to most households where coal is consumed. Moreover, they must recognize that the success of any undertaking, and particularly the price at which gas can be sold, depends on the disposal of the main bye-product, coke. His object had been to suggest ways in which they, who come into daily contact with the public, could further the sales of coke.

Coke Salesmen.

Those who read the full report of the paper and discussion in the March " Gas Salesman " will find much of interest. As is well known, coke selling in Birmingham has been reduced to a fine art, largely through attention to quality supported by sales organization. It is their policy that every gas salesman shall be also a coke salesman, but in addition they have special coke canvassers to keep in touch with their 40,000 coke consumers. Service of this kind is found necessary, otherwise the coal merchant books an order when he calls. Small quantities are delivered, and every effort is made to get regular orders placed.

Competition is keen, as Mr. Arms pointed out, not only with coal, anthracite, and oil, but with other smokeless fuels from low-temperature plants and patent ovens. In conjunction with this brief reference to Mr. Arms' paper, it is worth quoting again what Colonel W. M. Carr said in his recent Presidential Address to the Manchester District Institution. " In the Stretford Undertaking a salesman is employed whose time is almost entirely devoted to the sale and marketing of coke, and in attending to service to the buyers; and as a result of his salesmanship, coupled with careful attention to quality, we have had no difficulty in disposing of the whole of our production of coke within our own area during the past five years."

National Gas Council

Meeting of Central Executive Board

A Meeting of the Central Executive Board was held at 28, Grosvenor Gardens, S.W., on Tuesday, March 10—Sir DAVID MILNE-WATSON, LL.D., D.L., in the chair.

THE LATE ALDERMAN F. S. PHILLIPS, J.P.

The Chairman referred to the irreparable loss which the Gas Industry had sustained in the death of Alderman Phillips, Chairman of the Gas Committee of the City of Salford. He was one of the first members of the National Gas Council, and had acted as one of the Vice-Chairmen of the Central Executive Board since the reconstitution of the Council in 1919. He became Mayor of Salford in 1910, and had been a Member of the Gas Committee for 44 years, receiving the Freedom of the City of Salford in recognition of his 38 years of service to the town. There had been no greater loss to the Gas Industry in recent years.

After paying tribute to the rare qualities of the late Alderman, the Chairman moved a sincere vote of sympathy both to the relatives of Alderman Phillips and to the City of Salford, which was passed, all standing.

GAS LEGISLATION.

The appointment by the President of the Board of Trade of the promised Committee to consider the recommendations contained in the 2nd Report of the National Fuel and Power Committee, and to report what amendments to existing gas legislation were desirable and necessary to give effect to those recommendations by general legislation or by special order, was reported.

It was stated that the first meeting of the Committee had taken place on March 5.

DE-RATING.

It was reported that a letter had been received from the Private Secretary to the President of the Board of Trade in reply to the Council's claim for a rebate on the rates payable in respect of gas undertakings. The Board of Trade state that there is no intention at present of proposing to Parliament legislation to extend the de-rating provisions of the Rating and Valuation (Apportionment) Act, 1928, and the Local Government Act, 1929.

"NATIONAL GAS APPLIANCES AND FITTINGS ADVISORY COMMITTEE."

It was reported that the first meeting had taken place on March 5 of the Central Body, the formation of which was recommended in the Report to the Board of Trade of the Departmental Committee on Deaths from Gas Poisoning. The Committee consisted of the representatives appointed by the various bodies in the Gas Industry as their nominees.

Sir Francis Goodenough was elected permanent Chairman of the Committee.

As the work of the new Committee would, to a large extent, supersede that of the Gas Safety Committee of the National Gas Council, the Central Executive Board took the opportunity of thanking the Gas Safety Committee for their work in the past, and of discharging the reference to them.

The new Committee, it was stated, would be known as the "National Gas Appliances and Fittings Advisory Committee," and the Board of Trade would be informed of its constitution. The Central Executive Board agreed to allow Mr. E. J. Fottrell to act as Hon. Secretary to the Committee.

GOVERNMENT SUPPORT OF ELECTRICITY.

It was reported that in accordance with the decision of the Board, the Premier had been communicated with and asked to receive a deputation from the Council on this matter.

RESTRICTIONS ON THE USE OF GAS IN COUNCIL HOUSES.

It was reported that on Feb. 17 the London County Council had approved the following recommendation of the Housing Committee:

> That, as far as practicable, it is desirable, provided that no additional charge on the rates is involved thereby, that equal opportunity should be given to gas companies and electricity supply authorities to install their services in the Council's dwellings, and that the Council's tenants should be afforded freedom of choice in the use, whenever available, of gas or electricity, or both.

ANNUAL GENERAL MEETING OF THE COUNCIL.

It was agreed that the Thirteenth Annual General Meeting of the Council should be held on Tuesday, June 30, 1931.

BRITISH INDUSTRIES FAIR, BIRMINGHAM.

A vote of thanks was passed to the Joint Committee of the Gas Industries Section, as well as to the exhibitors. It was decided to give every support to the Gas Industries Section at the British Industries Fair in 1932.

Atmospheric Pollution*

The issue, by the Department of Scientific and Industrial Research, of the 16th Report on the Investigation of Atmospheric Pollution calls attention again to the existence of the smoke problem and the extent to which attempts to solve it are meeting with success. The Department has appointed an Atmospheric Pollution Research Committee to advise on the work, and in order to maintain touch between the central organization and the co-operating authorities, and to promote the application of the results of the research, an autonomous body known as the Standing Conference of Co-operating Bodies has been established. Reports by both the Standing Conference and the Research Committee are included in the 16th Report now issued, as well as a report by the Superintendent of Observations.

The Standing Conference mention that in the year of report, 1929-30, they caused inquiries to be made of the co-operating authorities as to steps they had taken to abate the smoke nuisance, since it was felt that knowledge of action taken and experience gained by different authorities might be useful to others. The summary of the replies given in the report indicates that, quite apart from the powers given to them under the Public Health (Smoke Abatement) Act of 1926, a number of authorities are taking active steps by enlisting the co-operation of house dwellers and factory owners in dealing with the domestic smoke and factory smoke problems respectively.

Domestic smoke is now well recognized to be the principal contributory cause of the smoke nuisance in many of our large towns. Estimates for London and Glasgow have shown that smoke in these cities is 2½ domestic to 1 industrial and 3½ domestic to 1 industrial respectively. The burning of every ton of raw coal in a domestic open grate has further been estimated to cause 10s. worth of damage in many areas. Evidently the town dweller must sacrifice his cheerful coal fire if he is to gain the benefit of a clear atmosphere; and many local authorities, the report indicates, are doing what they can to induce this necessary spirit of self-sacrifice. As regards smoke from industrial furnaces or public premises, the summary refers by way of example to steps taken by Wakefield, Dewsbury, Glasgow, Sheffield, and Edinburgh.

The Research Committee in their report describe a new investigation. That smoke from densely populated districts affects the clearness of the atmosphere throughout wide areas has been shown by the fact that visibility at Valentia, on the S.W. of Ireland, has been found to be affected by smoke from industrial areas 350 miles away. The Committee have set out to get more information about the spread of pollution by an investigation in progress at Norwich, in which daily observations are made of the spread of pollution down wind from the city. The Committee also refer to the development of an apparatus, a description of which is about to be issued, for measuring sulphur, the most actively destructive element of pollution in the air.

A comparison of the annual records of pollution from 1915 to 1928 showed that, while there was a progressive improvement down to 1921-22, if the evidence for London and Glasgow applies at all generally, little, if any, advance has been made since. The year 1929-30, however, indicates a trend in the right direction; that is the conclusion recorded by the Superintendent of Observations, Dr. J. S. Owens, in his report.

* Department of Scientific and Industrial Research. The Investigation of Atmospheric Pollution. Report on Observations in the year ended March 31, 1930. Published by H.M. Stationery Office, Adastral House, Kingsway, W.C. 2; price, 4s. net.

GAS IN NORTHERN IRELAND

His Grace the Duke of Abercorn, Governor of Northern Ireland, performed the Official Opening, on Wednesday, March 11, at Coleraine, of a new installation of vertical retorts and a gasholder recently built at a cost of approximately £15,000. The vertical retorts comprise four Glover-West continuous retorts of the 40 in. "steaming" model, and were erected by Messrs. West's Gas Improvement Company, Ltd., and the gasholder is of 100,000 c.ft. capacity, erected by Messrs. R. & J. Dempster, Ltd., in an existing tank

The opening ceremony was performed in the presence of a large assembly, which included representatives of the most important municipal bodies in Northern Ireland. His Grace, after turning on the valve admitting the gas to the mains, made a close inspection of the vertical retort installation and toured the works, in the whole of which he was very much interested. Subsequently the visitors were entertained at luncheon at the Town Hall, where the Mayor (Alderman Christie) presided.

After the toast of "The King" had been loyally honoured,

The Mayor submitted that of "The Governor of Northern Ireland." He said they felt highly honoured by His Grace's visit and by the interest shown by him in the affairs of the borough. His Grace came of a distinguished family which was noted for its high sense of duty and its very special interest in the welfare of Ulster. He discharged his duties with universal acceptance, and by keeping in close touch with the people had gained for himself their utmost esteem and affection. [Applause.] There were many Governors in the Empire, but he ventured to say that His Grace the Duke of Abercorn was the most popular representative of the King in all His Majesty's Dominions.

The toast was enthusiastically received, and His Grace, replying, said they were hearing a great deal about electricity at present, and he was sure that in an urban district like Coleraine there was ample room for both gas and electricity.

The toast of "The Borough of Coleraine" was proposed by Mr. M. M. M'Causland, H.M.L., who remarked that the Corporation of Coleraine had again come into being after an abeyance of some eighty years. On behalf of County Derry, he wished them very many years of success.

Responding, the Mayor said that the practical enterprise in connection with which they were met there that afternoon was the extension of the gas-works. The spending of the sum of £15,000 on that undertaking might seem a lot of money; but they had been well advised, and they believed that the ultimate economical result of that expenditure would enable the Council not only to give the people and consumers a very much better service, but also to pay off loan charges. At present they were waiting the consent of the Ministry of Commerce to an electricity supply scheme. The two undertakings would go hand-in-hand, and there would, therefore, be no risk of any iniury to the gas-works from the establishment of an electric light station in Coleraine.

THE GOVERNOR BEING SHOWN THROUGH THE WORKS BY THE CONSULTING ENGINEER, MR. J. D. SMITH (second from left).

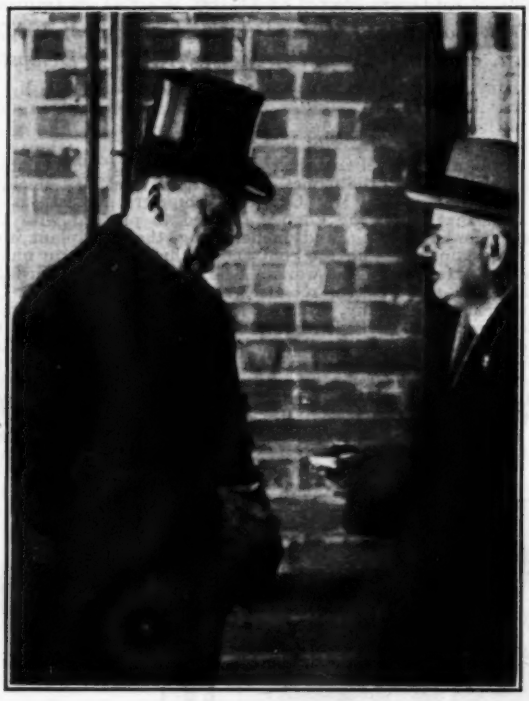
"Expedition and Thoroughness."

Alderman R. F. M'Cartney, J.P., proposed "The Contractors," coupled with the names of Mr. Frank West, M.I.Mech.E., M.Inst.Gas E., and Mr. Charles Dempster, M.Inst.Gas E. He said that when the Council decided to proceed with this scheme for improving and modernizing the gas plant they were most fortunate in the contractors they secured to undertake the extension of the works. The contract for the installation of the new vertical retorts was entrusted to West's Gas Improvement Company, Ltd., of Manchester—a firm of world-wide reputation. They regretted that Alderman West, the head of the firm, was not able to be with them that day. They knew something of the prominent position he occupied in the great City of Manchester, where he had served in the high office of Lord Mayor. He had taken a personal interest in the work at Coleraine, and showed it by a visit during the progress of the contract. They were pleased that his brother, Mr. Frank West, was present, and congratulated him on the expedition and thoroughness with which his firm had completed their work. [Applause.] The erection of the new gasholder was in the very capable hands of another eminent firm known all over the world—Messrs. R. & J. Dempster, Ltd., of Manchester. Messrs. Dempster were old friends of the Coleraine Council, and had carried out similar work for them in former years, and always to their complete satisfaction. He was glad that Mr. Charles Dempster was with them that day, and congratulated him on the speedy and satisfactory completion of his firm's contract. [Applause.] They had already had a brief experience of the improvements. The average man judged gas by the quality of the light supplied, and since the new works were put into operation the gas service had been quite satisfactory, and he had no doubt that from the Council's point of view the financial and other results would be equally satisfactory.

A Tribute to the Manager.

Mr. Frank West, replying, paid a warm tribute to the whole-hearted co-operation and the unfailing courtesy and kindness extended to his firm's staff by Mr. F. G. M'Elwee, Engineer and Manager of the Coleraine Gas-Works, during the progress of the work entrusted to them. They had done their best to build in Coleraine an installation of Glover-West vertical retorts in which the results of experience and research had been fully incorporated; and they were quite sure that Mr. M'Elwee would exploit it with such ability and such care as would secure the best results consistent with economy in operation and in maintenance. The carbonizing plant which had been inspected by

that distinguished company and honoured by inauguration at the hands of His Grace the Duke of Abercorn was an example of the interesting fact that in gas manufacture the small unit could be designed to operate with an efficiency which was not surpassed by the largest installation of carbonizing apparatus in the world. This point should be noted, because the maximum efficiencies in the generation of electricity were only attained in the great super-stations. He was aware, of course, that their friends in the South of Ireland were accustomed to bright ex-



Mr. Frank West Presenting the Governor with a Souvenir Gold Cigarette Lighter.

pectations arising out of their great water-driven electricity scheme—expectations which, he thought, would be considerably modified when they began to find out what losses in transmission might amount to. But there was no need for anyone in the Gas Industry to be unduly worried about the, often healthy, competition of electricity. Once again one might usefully draw attention to the well-established fact that both industries flourished side by side. And once again they might turn to the great cities of North America, where electricity, particularly when it was generated by water power, was produced as cheaply as anywhere in the world. In Canada, especially, the use of electricity was so highly developed that the consumption per capita was three or four times as much as it was in this country. But, at the same time, the consumption of gas per capita was greater in Montreal and Toronto than it was in Manchester, Birmingham, or Belfast. And the same observation was true with regard to New York and Chicago, the home of the mammoth steam-driven power stations. Northern Ireland, then, was doing well to develop and expand her Gas Industry. Indeed, it was interesting to note that gas engineering practice in Northern Ireland had kept, at any rate during the last fifty years, quite in line with the best practice in the British Isles—that was to say, well in line with the best practice in the world, because in gas engineering at least they in these Islands acknowledged no superiors. [Applause.]

Mr. CHARLES DEMPSTER also replied, and, after thanking the mover of the toast, and the company for their cordial reception of it, said that during the last fifty years his firm had carried out many contracts and erected or reconstructed all the gasholders at the Coleraine Gas-Works, though it was the first time he had had the privilege of visiting Coleraine himself. He was quite sure that the work recently accomplished by the two Manchester firms would prove both beneficial and economical, and he hoped that the increasing prosperity of the undertaking and the town generally would be such that, in the near future, they would again be called upon to carry out extensions of the plant.

"The Consulting Engineer" (Mr. J. D. Smith, M.Inst.C.E.) was proposed by Councillor D. MACLAUGHLIN, who said they had a very efficient Gas Manager in Mr. F. G. M'ELWEE, but the Council decided to call in Mr. Smith as Consulting Engineer. They were guided in that choice not only by his well-known professional and scientific qualifications, but also by his proved efficiency in the success which he had made of the Belfast Gas Undertaking. He thought he could say without fear of contradiction that the Belfast Gas Department could hold its own with any in the Three Kingdoms; and that, he took it, was due to the capable supervision of Mr. Smith. Not only did Mr. Smith undertake the work in Coleraine, but he showed the greatest interest in the progress of the scheme, and made sure that it would be a success.

A PLENTIFUL AND CHEAP GAS SUPPLY.

Mr. J. D. SMITH, responding, said since the Borough Council asked him to act as Consulting Engineer to the Gas Department he had been looking forward to the time when the alterations and extensions recommended by him would be completed and in operation, as he felt confident that Coleraine would then possess a gas undertaking worthy of its importance and equal to its needs as a busy commercial town. A plentiful and cheap supply of gas would go a long way towards bringing the staple industries of Coleraine to that stage of prosperity for which they all hoped not alone for Coleraine, but for all the towns and cities of the Province. Though hampered by restrictions, the Gas Industry was full of vigour. It depended for its existence on the service it could render to the community; and that the service was appreciated was evidenced by the continual growth in the output of gas. When it became evident that the gas-works would require reconstruction and extension, the Council attacked the problem with courage and foresight, and now they had an undertaking equipped with efficient gas-producing plant capable of supplying the needs of the community for many years to come. It was only right that he should tell the Council that it was likely that other plant in the works would from time to time require renewal and extension, and he hoped when that time came that the problem would be tackled in the same efficient manner as the work just completed. He could not speak too highly of the splendid spirit that inspired everyone connected with the undertaking. To carry out a reconstruction scheme of that sort entailed a great strain on the Engineer, and it would, therefore, be understood that Mr. M'Elwee had had a very strenuous time lately. He rose, however, to the calls made upon him, and he (Mr. Smith) was grateful for his assistance. Everyone realized the importance of the scheme and their duty as public servants, and for that reason

THE VISITORS TO COLERAINE.

Front row seated: The Mayor, with, on his right, the Governor and Mr. J. D. Smith; on his left, Mr. Frank West and Mr. Charles Dempster.

he had no doubt that the prosperity of the Coleraine Gas Undertaking was assured.

The following description of the Coleraine Gas-Works is taken from a brochure issued in connection with this function:

The first gas-works was built in Coleraine in 1845, in which year the output was something between 4 and 5 million c.ft. In 1906 the demand had increased to 23 millions, and the works was practically rebuilt with regenerator horizontal retort settings, which were the latest development of their time. The ancillary plant included a new exhauster, washer and scrubber, purifiers, station meter, gasholder, governors, and sulphate of ammonia recovery plant, all of suitable dimensions to meet the increased demand.

In 1924 the demand had increased to 36 million c.ft., and further extensions were carried out, including an additional lift to the gasholder and an extension to the carbonizing plant.

From 1924 to 1929 the output increased so rapidly that, notwithstanding the addition of further horizontal retorts, it was found impossible to deal with the demands on the undertaking.

On the recommendation, therefore, of the Engineer and Manager, Mr. F. G. M'Elwee, the Council engaged Mr. J. D. Smith, M.Inst.C.E., Chief Engineer to the Gas Department of the City of Belfast, to report on the position of the undertaking and to submit proposals for the further extensions which were necessary.

Mr. Smith commented, in the first place, on the rapid rate at which the demands on the undertaking were growing, and were likely to grow in the near future. He said that during the previous year an increase of some 14 p.ct. had been realized and that during the past ten years the output of the works had more than doubled. The Council was in the fortunate position of being able to supply gas at a price which, taking into account the size of its undertaking, is exceptionally low, and there was, therefore, little probability of the undertaking being adversely affected by any electrical competition which might develop, since, in order to give equal lighting and heating power at the same cost as gas, electricity would have to be supplied, whether for lighting or heating purposes, at figures which were most unlikely to be offered. While, therefore, it could scarcely be expected that the expansion of the demand for gas would be continued indefinitely at the present rate, there was every indication, in view of the enterprise and ability which were being displayed in the management of the undertaking, that a steadily increasing demand would be experienced for some years to come, and it was essential that there should be an adequate reserve of plant to satisfy it.

The Governor Opening a Gas Valve.

Mr. Smith had gone carefully into the question of extension of the existing retort bench, but quite apart from the fact that the present arrangement of the plant rendered this course impossible, he had no hesitation in recommending the much more economical proposition of providing a complete new carbonizing plant of modern design of sufficient capacity to provide a reasonable margin of safety, and capable of further extension to meet future demands. In his opinion, the most suitable type of plant was an installation of continuous vertical retorts equipped with elevating machinery.

In accordance with Mr. Smith's report, tenders were invited, and a contract was placed with Messrs. West's Gas Improvement Company, Ltd., of Manchester, for an installation of four of their Glover-West vertical retorts of the latest 40-in. "New Model," with provision in the retort bench for the accommodation of a future two retorts, and equipped with a mechanical lift for coal and coke handling.

Each of these retorts is capable of producing 80,000 c.ft. of gas per diem, at the calorific value of 450 B.Th.U. when using the coals available, so that the gross daily capacity of the completed bench of six retorts will be 480,000 c.ft.

The auxiliary plant since 1892 appears to have been provided by Messrs. R. & J. Dempster, Ltd. This plant comprises annular condensers, Livesey washer, washer scrubber, sulphate plant, and four gasholders.

Among the last named is one of the original Gadd & Mason spiral-guided holders, built in 1894. This has been out of service for a few years, but it remains on view in the form of a circular steel store-house, the holder bell having been lifted and supported out of the brick tank, which has been filled with ashes and suitably floored over. The Governor was much interested in this relic. There are two other spiral-guided gasholders, the largest, which is erected in a steel tank, having a capacity of 120,000 c.ft., while the new holder is of approximately 100,000 c.ft. capacity in two lifts.

NEW COKE PLANT AT ROCHESTER

Designed by Mr. C. Valon Bennett, this interesting plant has been manufactured and erected by Messrs. Drakes, Ltd., of Halifax

Most persons engaged in the Gas Industry appreciate, as do the local consumers of gas, that the Rochester, Chatham, and Gillingham Gas Company is a really live undertaking. It realizes that the goods it has to sell and the service it has to provide must be first class. Only a few weeks ago we gave an illustrated description of the new stores and workshops for its Distribution Department, and now we are able to refer to a most complete and efficient coke screening and storage plant which has recently been brought into use at the Company's Rochester Works. This plant has been designed by Mr. C. Valon Bennett, the Engineer to the Company, and has been manufactured and erected by Messrs. Drakes, Ltd., of Halifax. It consists of a conveyor of the drag-bar type, which takes the coke from the top of an inclined conveyor (erected some years ago) from the retort house, and delivers either into a cutter or, by means of a by-pass chute, direct to a set of reciprocating screens, and thence to the storage hoppers.

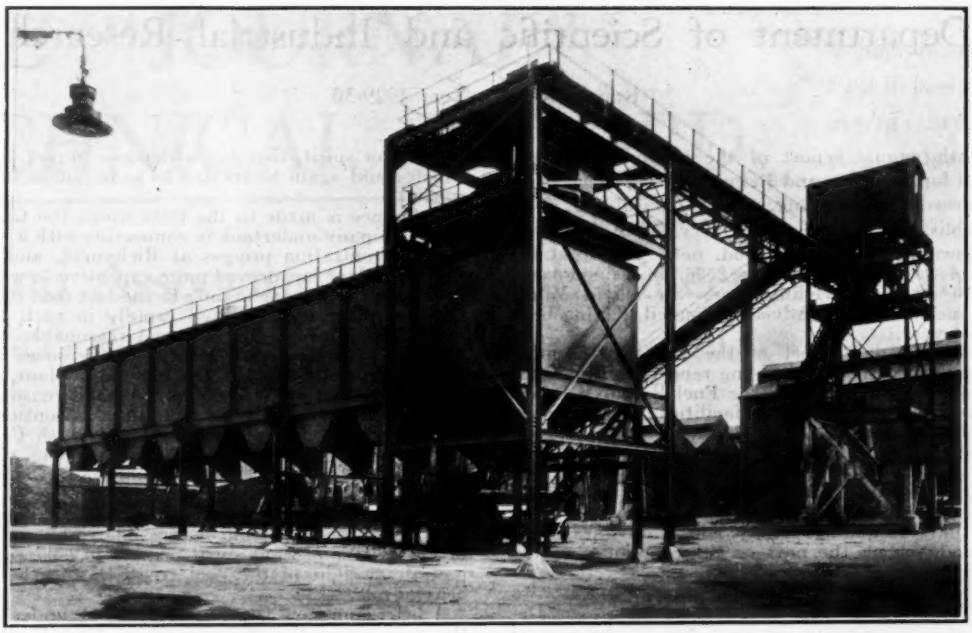
On account of the unsatisfactory nature of the ground, it was decided that the whole of the structure must be carried on reinforced concrete piles, and sixteen of these were driven to an approximate depth of 36 ft. The piles for the hoppers and screens are connected at their tops by means of reinforced concrete cross-beams, but the piles for the cross conveyor structure are entirely separate, so that in the event of any vibration being set up on the hoppers and screens this would not be transmitted through the conveyor to the existing structure and adjacent buildings. This foundation work was carried out by Messrs. Peter Lind & Co., of London.

The cross-yard conveyor is about 80 ft. centres, the framework being of the lattice girder type without any intermediate stanchions, thus obviating obstruction in the yard. The trough of the conveyor is 3 ft. wide, lined with cast-iron plates, and a platform with handrailing runs the full length of the conveyor. The chute at the end of this conveyor is fitted with a hinged door for the by-pass, and the cutter is of Messrs. Cort's type, driven by a Hans Renold chain and belt, with a safety device to prevent damage should any obstruction occur in the cutter.

The screens are built of mild-steel plate and angle trays, supported upon ash legs, and are in two units, each unit having two trays, balanced one against the other, and driven from its own crankshaft, these cranks being supported in roller-bearing pedestals.

The first unit of trays is fitted with perforated plates suitable for taking out breeze up to $\frac{3}{4}$ in. size, nuts $\frac{3}{4}$ in. to $1\frac{1}{4}$ in., and medium $1\frac{1}{4}$ in. to 2 in., the oversize passing

THE NEW COKE HANDLING PLANT AT ROCHESTER.



A VIEW OF THE HOPPERS.

to the second unit of plain trays, or direct into the hopper for large coke. It is so arranged that it is only necessary to run the second unit when feeding coke to the end compartments of the hoppers.

The cross drag-bar conveyor is driven by Hans Renold chains and machine-cut spur gear from an 8-h.p. motor, the coke cutter by a 12-h.p. motor, and the screens by two 8-h.p. motors, these being of the Lancashire Dynamo and Motor Company's manufacture, of a special totally-enclosed gas-works type.

The control panels for these motors are fixed in the retort house, and these are interlocked so that in the event of one motor failing the others are automatically stopped. Remote push button stops are also fitted alongside the conveyors to enable the attendant to stop the plant from a position by the cross conveyor or on the top of the hoppers.

The hoppers, which were specially designed by Mr. Valon Bennett to suit the local conditions, are of mild-steel plates, lined with concrete and a facing of "Ironite." These hoppers are 13 ft. 6 in. wide, about 15 ft. deep by 94 ft. long, and are divided into three compartments for screened coke and two compartments for the large. Suitable slide doors and levers are provided for feeding carts or lorries, and eight sets of bagging chutes are fitted for the screened and large coke, these chutes having a static screen in the bottom to take out breeze up to ¾ in. size.

The whole of the plant is provided with staircases and platforms to give access to the various parts, and is supported upon a structure built up of rolled-steel joist stanchions, longitudinal and cross members.

The capacity of the plant is 20 tons of coke per hour, and the hoppers will store approximately 180 tons of screened coke and breeze, which can be delivered into lorries or bags.

Remarkable Corporate Propaganda

One of the finest and most extensive examples of corporate propaganda on behalf of the Gas Industry was possibly noticed by many of our readers in last Thursday's issue of the "Evening Standard." Five Metropolitan Companies (the Gas Light and Coke, South Metropolitan, Croydon, Tottenham, and Wandsworth) co-operated in devoting four full pages to furthering the intersts of the Gas Industry throughout the country in general and in the Metropolis in particular.

In a series of interesting articles the days before the advent of gas, or when it was taken round the streets in cylinders, were compared with the present time when, quite apart from all its domestic uses, gas is used in almost every industry. The very early days of gas were depicted, when it was first used to illuminate the Carlton Place Gardens on the King's birthday in 1807. Later, in 1813, two pioneers, William Sturt and William Knight, of Fleet Street, were prosecuted for "the making of gas light, and making and causing to be made divers large fires of coal and other things whereby divers noisome and offensive stinks and smells and vapours resulted."

The particular advantages of gas lighting in foggy weather were dealt with, together with the remarkable success of the gas lighting installation on the Hastings Road at Lewisham. The staggering figures of the Industry were instanced, from which it was to be seen that of a recent census of 318 important cities and towns with 17,000 miles of streets, 13,000 are lighted by gas. London has about 100,000 gas lamps in its streets, while of 666 miles of streets in Birmingham, 660 are gas-lighted.

Gas and its invaluable services to industry received full attention, its many advantages over other fuels being indicated. The use of gas in the catering trade also had special mention, and it was stated that the firm of Messrs. J. Lyons & Co. use nearly 535 million c.ft. of gas a year in their London establishments alone. Each of the co-operating concerns included some interesting facts and figures on their own behalf in a striking manner, while illustrations depicted typical examples of gas equipment for the kitchen and living room.

Finally, a comprehensive section touching upon all the uses of gas for domestic purposes, and explaining in detail the labour-saving devices for lighting, heating, cooking, and water heating, which help to give the housewife greater leisure, concluded what should prove a very valuable publicity effort, for which those co-operating in its production merit the congratulations of the Industry as a whole.

Department of Scientific and Industrial Research

Report for the Year 1929-30

The fifteenth annual report of the Committee of the Privy Council for Scientific and Industrial Research, covering their proceedings from Aug. 1, 1929, to July 31, 1930, has been published by H.M. Stationery Office, Adastral House, Kingsway, W.C. 2, at 3s. 6d. net. The total net expenditure of the Department was £536,746, as compared with £485,450 in the preceding year. Sir David Milne-Watson is a member of the Advisory Council, having been appointed last year.

The fifteenth annual report of the Advisory Council, which is submitted with the foregoing report, mentions the detailed proposals received from the Fuel Research Board in connection with the provision of facilities for conducting extensive investigations on the production of metallurgical coke, the main feature of which is the erection at the Fuel Research Station, East Greenwich, of experimental coke ovens, at an estimated capital cost of about £50,000. Having discussed various aspects of the subject, the report states that the Gas Industry may derive advantage, as there is a tendency on the part of gas companies to try some form of coke oven in place of the usual gas retort.

The question of low-temperature carbonization is also dealt with in a brief reference to the activities of the Department in this field during the year, and to the general economic factors involved in commercial exploitation of this method of treating coal. A conference of firms interested in low-temperature processes met twice during the summer in order to consider what further lines of research were required, and it was generally agreed that further work was principally required on the properties of the tar obtained in low-temperature distillation, especially in the direction of obtaining, by cracking or hydrogenation (which latter is dealt with in the report under a separate heading), a conversion of a large percentage of its bulk into motor spirit. The results obtained by hydrogenation of the tar are given in some detail; but briefly it has been shown that it is possible to convert some 70 p.ct. of the tar by volume into motor spirit, together with some 20 p.ct. of neutral oil which could again be treated so as to obtain further motor spirit.

Reference is made to the tests which the Gas Light and Coke Company undertook in connection with a low-temperature carbonization process at Richmond, and it is stated that this plant has proved more expensive to work than had been anticipated, due mainly to the fact that the metal used for the retorts deteriorated rapidly in such a way as to increase the labour costs beyond reasonable limits. Four different types of retort, involving differences in metal and design, were embodied in the Richmond plant, but all have suffered distortion. The Council have reason to believe, however, that, largely as a result of attention which has been given to the problem by the British Cast Iron Research Association, this difficulty is being rapidly overcome. The future of the Richmond plant, therefore, is now under consideration.

On the question of hydrogenation of coal, the latest results show that it should be possible to obtain a minimum of 120 gallons of light spirit per ton of coal (*i.e.*, about 40 p.ct. by weight of the coal treated), together with some heavier oils.

A brief summary is given of the work undertaken during the year under the direction of the Fuel Research Board. [This work was reviewed in the "JOURNAL" for Jan. 14, 1931, p. 100.] The report mentions that experiments on the heating of horizontal gas retorts have been carried out, from which it would appear possible to increase the throughput of such retorts by over 40 p.ct. without increasing the maximum working temperature or adversely affecting the life of the retorts. Arrangements have now been made by which the conditions of working of the water gas plant can be closely controlled and all essential factors measured. Thermal balances and carbon balances can now be obtained with an accuracy of about 2½ p.ct. The effect of the different variables on the performance of the plant is now being studied.

NOTES ON PLANT AND PROCESSES

Aluminium—Its Production, Properties, and Application.

The British Aluminium Company have a happy knack of always producing most attractive booklets describing their manufactures, and their latest publication, bearing the above title, is no exception.

Bound in a very strikingly original cover and containing a number of excellent full-page photographs illustrating modern applications of their products, this booklet sets forth in a readable manner the various stages in the production and application of aluminium and its alloys with the object of offering guidance to those who desire help in attaining to the best degree the benefits which aluminium may confer.

The growth of the aluminium industry, it is stated in the introduction, is amply demonstrated by official statistics. Since 1913 the world consumption of copper has increased by 72 p.ct., of zinc by 45 p.ct., of tin by 46 p.ct., but during the same period the consumption of aluminium has increased by 310 p.ct. The booklet goes on to describe the preparation of aluminium, the process of reduction, and the preparation of carbon anodes, while among the advantages claimed are lightness, corrosion resistance, ductility, which is particularly evidenced by the fact that it can be worked into almost inconceivable shapes. Associated with this ductility is a tensile strength which is sufficient for a variety of applications; but the field of application is enormously widened by the fact that quite small additions of other metals result in profound changes in mechanical properties without great alteration in the fundamental characteristic of lightness.

Finally the applications of aluminium are considered, which are so numerous, it is stated, that, in some form or other, the metal is employed in practically every modern industry—from false teeth to battleships, from tea-wrappings to church spires.

New Material from Carbolic Acid.

Chemical research has resulted in the production of a new material which appears to have very many uses. This substance is the product of two common disinfectants, carbolic acid and formaldehyde. In the I.C.I. Research Laboratories at Blackley, it was found possible to produce a powder from these two chemicals which could be moulded into any shape and dyed in any colour, however bright. Although both carbolic acid and formaldehyde are in themselves unstable, in the final form the new substance has great resistance to heat and is a non-conductor of electricity. Already it has been used in the manufacture of such different articles as umbrella handles, lamp holders, switches and electric fittings of all descriptions, whether low tension or high tension, wireless appliances, and telephone equipment. It can replace vulcanite in most of its uses, or take the place of ebony for the backs of brushes. It can be used instead of celluloid for shaving stick handles, ivory for cigarette holders, porcelain for ashtrays, or tortoiseshell for toilet requisites. It is as difficult to scorch as it is to break. More remarkable still, screw threads can actually be moulded into it.

The original product is known as a synthetic resin, or, to give it its full name, phenol-formaldehyde resin. It is a dirty grey powder resembling road dust. This is poured into moulds of any shape, which are closed by hydraulic steam-heated presses. The mass solidifies and in a few moments the press is opened and the finished article, bright and polished, is ready for use. The colour is brought out in the pressing.

THE "JOURNAL" TECHNICAL RECORD

Which also contains Full Reports of Meetings of Gas and Allied Associations ———

Midland Association of Gas Engineers & Managers

Presidential Address of Mr. H. J. Woodfine, of Wellington (Salop), and a Discussion on Domestic Use of Gas

The Annual General Meeting of the Association was held on Thursday of last week, in the Grand Hotel, Birmingham; the chair at the outset of the proceedings being occupied by Mr. Alfred Bird, of Bromsgrove, the outgoing President, and subsequently by the new President, Mr. H. J. WOODFINE, Managing Director, Engineer, and Secretary to the Wellington (Salop) Gas Company.

The HON. SECRETARY (Mr. Arthur Roberts, of Hereford) read the minutes of the last meeting, which were confirmed.

LOSSES BY DEATH.

Mr. BIRD referred with deep regret to the death in February of Mr. W. Gorse, of Cheltenham, who had been a member of the Association for thirty years, and also to the death on the previous day (March 11) of Mr. W. H. Adams, of Bilston, who had been a member for twenty-five years. Mr. Adams was a Past-President of the Association, and took a great interest in the meetings, at which he was a regular attendant. The Secretary would send a letter of sympathy to Mrs. Adams and her family, and also a wreath for the funeral.

As a mark of respect, the members stood silently.

The report and accounts were thereafter adopted, on the proposition of Mr. BIRD, seconded by Mr. F. SHEWRING (Stratford-on-Avon).

COMMERCIAL ASSOCIATION.

Mr. W. S. MORLAND (Gloucester) said he had been asked, owing to the unavoidable absence of the Chairman (Mr. Harold Davies, of Chesterfield) to present the report of the Midland Commercial Gas Association, for the year ended Dec. 31. In doing so, he would like to read a portion of a letter which Mr. Davies had sent, and in which he said:

> Had I been proposing the adoption of the Midland Commercial report, I should like to have drawn attention to the attendance at our meetings. Surely with a membership of 70 we could have a better attendance than 20, and in view of the difficulties that are ahead of us in connection with coal and coke, I think it behoves every member to take some little active interest in the work of the Association, which has covered a good many, if not all, of the commercial aspects of the Industry during the past twelve months.
>
> I should just like to mention the Area Gas Supply report. I was able to render some little assistance in preparing the evidence of the Gas Industry for this Committee. We shall have to wait and see the results of the findings of the Committee, when the two Bills which have been deposited covering the South Yorkshire Area Gas Supply have been put through the usual parliamentary inquiry.

Personally, he (Mr. Morland) felt that it was a great advantage to belong to the Commercial Gas Association. It would be beneficial to all who were not already members to join, because there was a great deal of information to be gleaned at the meetings. The monthly circular, too, was most useful. It offered members an opportunity of disposing of second-hand plant, and things of that kind.

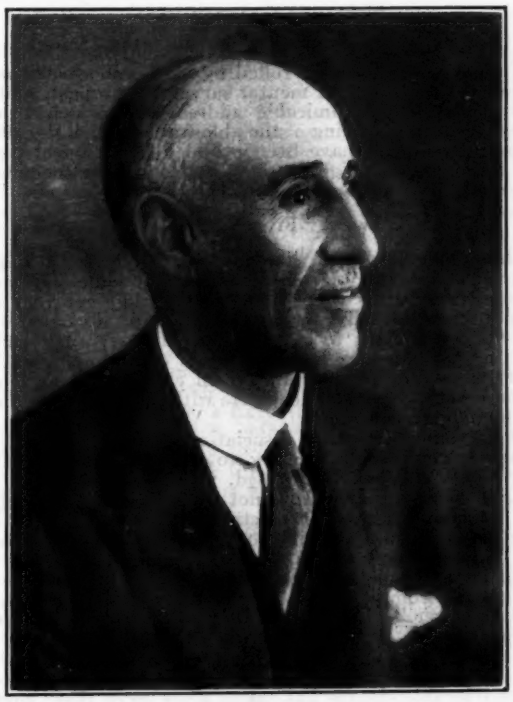
Mr. R. S. RAMSDEN (Leamington), seconding, expressed his personal thanks to the members of the Committee for the help they afforded in putting forward what was really a co-operative effort. He hoped they would get better attendances at the meetings, and that more would consider it worth while to join the Commercial Association. The subscription was the trifling one of 10s. 6d. for the larger undertakings, and 5s. 3d. for the small ones.

The report was unanimously adopted.

APPOINTMENTS.

Mr. BIRD then moved that Mr. H. J. Woodfine be appointed the representative of the Association on the Council of the Institution of Gas Engineers, and that the following be appointed to represent the Association on the Midland District Education Committee: Messrs. H. J. Woodfine, E. B. Tomlinson, F. C. Briggs, and W. G. S. Cranmer.

Mr. MORLAND seconded this, and it was agreed to.



THE PRESIDENT.

H. J. WOODFINE, of Wellington (Salop).

Mr. Woodfine spent seven years in the Engineering Department of the Birkenhead Joint Railways, under the late Mr. R. E. Johnston, M.Inst.C.E. He was for thirteen years in the Gas, Water, and Electricity Department of the Wallasey Corporation, under Mr. J. H. Crowther. Mr. Woodfine entered the service of the Wellington (Salop) Gas Company as Manager in May, 1905, and is now Managing-Director and Secretary.

Mr. BIRD said he had had a letter from the Hon. Secretary resigning his position at the end of the Association year—February, 1932. Mr. Roberts said in this letter: "I have held the office three years, and have enjoyed the work, and am only sorry I cannot see my way to continue. Unfortunately, the bulk of work is at the time of year when I am least able to cope with it, and geographically I am not well situated with regard to Birmingham." Mr. Bird went on to say that they all knew what a great help Mr. Roberts had been to the Association, and they hoped he would think the matter over, and continue to hold the position for a year or two longer. ["Hear, hear."]

THE NEW PRESIDENT.

Mr. BIRD said he now had the pleasant duty of handing the badge of office to the new President, Mr. Woodfine,

who had been a personal friend of his for a quarter of a century. He was sure Mr. Woodfine would make an excellent President, and trusted he would have as pleasant a year of office as he himself had enjoyed.

Mr. H. J. WOODFINE (Wellington) then took the chair, and thanked the members for the cordial way in which they had received him as their new President. He proposed a hearty vote of thanks to the retiring President for his services in the chair. Mr. Bird had passed through his year of office with much success, and had worked hard. ["Hear, hear."] He had much pleasure in presenting Mr. Bird with the customary memento of his Presidency, and expressed the hope that he might live long to wear it.

Mr. P. N. LANGFORD (Coventry) seconded the vote of thanks, and endorsed everything that Mr. Woodfine had said.

Mr. BIRD, in acknowledgment, declared that he had had a delightful year, and was indebted to the members for the excellent support that had been given him.

Mr. WOODFINE then proceeded to read his Presidential Address, explaining that the earlier portions of it—in fact, the greater part—had been prepared over four months ago, subsequent to which there was quite a spate of letters, editorials, and articles in the Technical Press on the subject of gas for lighting. Of course, many minds were thinking alike, and one might expect to find words and phrases used over and over again. There were words and phrases in that correspondence, &c., which he had himself used. He was, however, first in the field, and had not been guilty of piracy or anything of that kind.

PRESIDENTIAL ADDRESS

of Mr. H. J. WOODFINE, of Wellington (Salop).

Twenty-six years have rolled by since you elected me a member, and, taking a mental survey of the past, and recalling the many admirable addresses to which I have listened—to say nothing of the able way in which the affairs of our Association have been presided over—I feel that I am faced with no light task in endeavouring to emulate those who have preceded me in the Chair.

TWENTY-FIVE YEARS AGO.

Those members who, like myself, can look back on a quarter of a century of management, will smile and nod in acquiescence, when I say that "the world went very well then," when, literally, we sat at the receipt of custom waiting for applications to have the gas laid on; when suction gas and paraffin were the only clouds (and simply flecks at that) on a fair horizon, and when electricity was looked upon as too expensive to compete with gas except, perhaps, in the industrial field.

In his address to this Association in 1906, the late Mr. Fletcher Stevenson, referring to electricity in Coventry, and mentioning charges of 4½d. per unit for lighting and 1¾d. for power, said, "It is not to be expected that there will be much increase in electricity supplied for lighting, because in a manufacturing town the cost is all important, and the incandescent burner has made it impossible for electricity to compete with gas at the respective prices in Coventry. Competition is therefore practically confined to motive power." [See "GAS JOURNAL" for Feb. 20, 1906, p. 483.]

TO-DAY.

Considerable change has taken place since then; suction gas has, to a large extent, been displaced, and paraffin for illuminating purposes is little used in towns. But a new and more formidable competitor has taken up the position formerly occupied by suction gas, and there are few of us, I think, who have not lost business to oil fuel. This fuel has well established itself in the industrial field, and not content with that, has extended its tentacles into the domain of domestic heating.

The respective costs for industrial purposes of gas and oil fuel are well known, and it seems to me that, unless our present methods of charging (as generally applied) undergo an early and drastic alteration, and unless we are prepared for the sake of "overheads" to content ourselves with a bare margin of profit on some sections of our business, or even do as many traders are now compelled to do—viz., supply a portion of their output at cost, in order to keep capital and plant employed to the greatest possible extent—we are certain to lose much more of a very valuable load to this competitor.

And what of electricity? To-day, electricity is preferred to gas for the lighting of shops, stores, public halls, &c., at double the price mentioned by the late Mr. Fletcher Stevenson in 1906; moreover, it is making very substantial progress in houses, large and small.

The great progress which electricity has made, and will, I think, continue to make, in shop lighting, should not, I venture to say, occasion our Industry cause for surprise, although to those few members who, like myself, have not had to contend with a public supply of electricity until recently, the change over may cause a pang of regret.

We are agreed that electricity, in certain uses, has advantages over gas, and *vice versa*, and to my mind, for window displays and decorative effect our competitor is unchallengeable.

It is true that most excellent and effective use can be, and is, made of gas for the illumination of shop and store fronts and fascias, by means of outside lamps; but the business which we may hope to do in this direction is not, I think, likely to amount to much despite any difference in cost.

A SERIOUS CHALLENGE.

For domestic and public lighting however, gas can, and must, in my opinion, seriously challenge electricity. The inroads into domestic lighting which this competitor has made, and the efforts now being put forth to obtain a firmer grip, should not be taken calmly; they should cause us to become of one mind as to what we intend to do about it.

It must be obvious that our electrical competitor means, if possible, to shoulder gas out of the lighting field altogether, and aware as I am that some engineers and managers have reached the conclusion that, in time, this must come about, I am bold enough to say that our Industry cannot afford with equanimity to contemplate such an event. Yet, I can see quite clearly, unless we are united in the object of holding on by all and every means, the domestic lighting will be lost.

To my mind the progress made by electricity during the past few years is clearly a proof of what carefully planned and sustained propaganda can bring about.

For nearly half a century electricity has been available. It is the same light to-day as when first discovered, and it is still costly, so that to infer that its recent high rate of expansion has been brought about by its intrinsic merits as a source of artificial light would be wrong. No; it is the magnificent advertisement which, almost daily, it receives from the Press of the country, Ministers of State, and interested parties; the knowledge that the Government is aiding and assisting its development financially, and in all sorts of ways; and the insidious manner in which the public are led to think that an abundant supply at a penny per unit will be available for everybody, if only as many units per head of population be used here as in other countries.

These, I think, are the factors that, for the time being, have hypnotized the people, and have brought about a situation which gives gas little or no chance for the lighting of new property.

AN UNFAIR HANDICAP.

Unquestionably, our Industry is carrying on under a tremendous and most unfair handicap. It speaks volumes for the merits of gas that it has more than held its own against the heavy assaults of the past two or three years, and we are justified, I feel sure, in believing that, when the great push has spent itself—when it is found that the grid scheme, with its enormous expenditure, has not achieved the desired end (and all the signs are that it cannot)—gas will emerge from the conflict with its merits standing higher than ever in the opinion of the public.

With modern methods of production and distribution, the Gas Industry is in a position to supply artificial light as good as, and more reliable than, electricity; a light which is not damaging to eyesight and which serves the dual function of providing warmth and promoting ventilation.

Surely then, with these good points (which, I am afraid, all too seldom we bring before the public) augmented by an advantage in running costs (which in these times of acute trade depression and high taxation is of considerable importance to very many consumers), we have every inducement to maintain our present position in the field of domestic lighting; and if, by force of circumstances, we cannot make the advances which in the past we have been accustomed to, that is no reason why we should become apathetic, and quietly leave the field to our competitor. If we have pride in our Industry and our work, our slogan for the domestic lighting must be "What we have we'll hold."

We must not swallow the soothing-syrup doled out to us that there is room for both. I trust there is, but I should need a deal of convincing that our competitor has any intention of leaving to gas even the smallest portion of the lighting load.

There are not wanting signs that the Industry is becoming alive to the menace of the aims of the Electricity Board, and, taking a broad view, I feel that those in charge of gas undertakings are making big efforts to meet the exigencies of the situation. But it is imperative that we have more artistic fittings, more switches, still better burners, and further-improved service, and if, through our salesmen, we extol the good qualities and advantages of modern gas lighting, we shall achieve the reward which I feel confident awaits us.

I trust that my enthusiasm for gas in the field of domestic

lighting has been demonstrated at not too great a length, having regard to the compass of a presidential address, and, in my opinion, the importance of the subject.

Coal.

I turn now to discuss a few phases of management in the hope that they may be of interest.

Recent legislation with its quota system has given our Industry cause for concern in the matter of supplies, and if my experience during the early part of the month of December last can be taken as fairly typical of what happened all over the country, it would seem that prudence directs us to see that newly-discovered contingencies are provided for, when deciding upon the total tonnage for stock.

During the week which followed the stoppage of work in the pits in Scotland, I found deliveries to be very scanty, and for some days after a temporary settlement had been reached, full contract supplies were not forthcoming, so that, had the trouble spread, and culminated in a stoppage in all coalfields, I should have commenced that fateful period with appreciably less stock than I had arranged for.

Under the quota system, the spot lots for augmenting stocks which, in the past, some of us have banked on procuring at the first sign of trouble, will not be forthcoming; nor, I think, will full contract quantities be obtainable over the period during which notices are being worked out. In these circumstances, therefore, and bearing in mind the unsettled state of the coal industry, it should be the aim of every manager to guard against being caught short.

Ammoniacal Liquor.

For a period of over two years, our liquor has been discharged into the town sewers to avoid a loss, and to put to better use the labour required in the production of ammonium sulphate. Others, no doubt, are following a similar procedure, and as it is easy to cause serious trouble to the local authority by a haphazard discharge, and yet, by a systematic discharge, to get rid of one's make of liquor in this way, without trouble and expense, I have thought it desirable to embody in this address our methods at Wellington.

In the first place I approached the officer of the local authority directly concerned, and, with his consent, I arranged for one of my staff to make weekly visits—sometimes more than one—to the sewage works. With the data derived therefrom as to the sewage flow in summer and winter, day and night, and in wet and dry weather; the aid of an adjustable quantity-indicating liquor discharge cock; and regular conferences with the manager at the sewage works, we have been able to discharge our make of liquor into the sewer without complaint.

At times it has been necessary to stop altogether any discharge during the night; at others a reduced rate of discharge was permissible; hence the desirability of a regular liaison between gas-works and sewage-works.

With an increased make of liquor consequent upon the recent acquisition of a neighbouring undertaking, I now find myself in the position that I cannot safely discharge the whole of my production into the Wellington sewers, and I have, therefore, arranged to rail a quantity to a works producing sulphate of ammonia.

In this respect it may interest you to know that on pointing out to the Railway Companies that this liquor is now a waste product, considerable reductions in freightage can be obtained.

Quality of Gas.

It is of supreme importance to-day that every undertaking should supply a good gas. The Industry in the past has not been blameless in the matter of quality—there was too much competition for the highest make per ton of coal—but within recent years it has been able to congratulate itself on supplying gas of a regular composition and quality. This, together with adequate and steady pressure, is indispensable, for the consumer nowadays will not tolerate that varying mixture, which a few years ago he was compelled to put up with by force of circumstances.

To meet the requirements I have mentioned, there must be modern carbonizing plant; yet, I am afraid, there are some undertakings still carrying on with plant which is antiquated, and which, from lack of vision or reluctance to spend on the part of the directorate or committee, has to sustain a longer life than is demanded by the pressing need of present-day circumstances.

It requires courage, certainly, in these keenly competitive times, to present and push through a programme of work involving the expenditure of a relatively large sum of money. Small undertakings, to say nothing of those of medium size, find it difficult to raise capital in the face of electrical propaganda with its misleading statements as to the price of current; but where the carbonizing plant is incapable of producing gas of constant composition and quality day in and day out, the position has to be faced. Failure to do so will bring about a loss of goodwill and business to those undertakings in default, and will act as a brake on the progress of the whole Industry.

Pressures.

As with out of date carbonizing plant, so it is with a faulty pressure system; both are bad for the Industry, and every possible effort should be made to give the consumer (who now is much more observant and critical than formerly) satisfaction.

Housing sites at points far distant from the works, to say nothing of the ordinary expansion of output from the extended use of cookers, fires, and water heating appliances in most towns, have caused engineers and managers to give close consideration to the necessity for adequate and steady pressures; and while all methods for securing this very necessary state of affairs are expensive, the position, as in the case of carbonizing plant, must be faced.

At Wellington I have been exceptionally fortunate, in that it has not been necessary over the past twenty years to make any costly enlargements of low-pressure mains other than a trunk main enlargement of 150 yards or so from the Works to the main road; yet, our sales have increased from 40 millions to 151 millions, and our pressures throughout the town are such (I say it in all modesty) as to give me feelings of satisfaction.

This has been achieved by feeding our low-pressure mains from the high-pressure main supplying the outer areas, and I can say with every confidence that, for the attainment of straight-line charts at any desired pressure, this system would be difficult to improve upon.

Staff.

In this great Industry, to which we are proud to belong, there are the small and the big undertakings, as well as those of moderate size.

In the small undertakings it must be admitted that the difference between revenue and expenditure will not permit of any technical help. The managers of these undertakings must, perforce, shoulder all the burdens of works and district, and all praise to them for the way in which they stand up to so big a task. But what of undertakings of 80 to 100 millions output? Surely these, if properly and efficiently managed, should be able to afford so necessary an officer as a technical assistant and chemist?

I refer to this because of letters which appeared in our Technical Press some time ago, advocating the loaning by large works of technical assistants and chemists to works of 80 to 100 millions output.

I can well understand something of this kind being done, and it should be done for managers of small undertakings; but Works of the size I have indicated might well and reasonably be expected to employ, and at a salary which could not be criticized, a technical assistant and chemist. I cannot too strongly urge the need which apparently exists in our Industry to-day for an adequate and properly remunerated staff.

Service.

Earlier in this address, I stated that, broadly speaking, I was confident that engineers and managers were alive to what was necessary to-day in order to retain present business and goodwill and make further progress; yet it would appear—again I quote from our Technical Press—that every engineer and manager is not pulling his weight.

Complaints of a minor sort are inseparable from public utilities, but complaints of general inefficiency of service throughout a district (as were referred to a short time ago in one of our Journals) are damaging to our Industry, and, indeed, are inexcusable in these highly competitive times.

Much has been written emphasizing the necessity of good service to the consumer; yet the point must be hammered in at every conceivable opportunity until all the laggards have been aroused and brought up-to-date. Goodwill must be striven for, obtained, and held, and it is of no earthly use our being polite on the telephone, courteous in correspondence, or smiling in the showrooms, if our district supply is so poor a thing as to warrant criticism from our own Press.

Tariffs.

Notwithstanding all that has been written and spoken on the subject of tariffs and the urgency for meeting electrical competition by greater elasticity in our charges, little of a practical nature has been done.

It is true the Industry is shackled by the legislation of "days that are gone," and that big efforts have been, and continue to be, made to get those shackles removed; yet I am constrained to ask if we have satisfied ourselves that we really are so tightly bound as to be incapable of moving from the flat rate until fresh legislation comes along, by which time much valuable business will have been lost. I do not think so. There has been, I am afraid, too little individual effort and too much waiting to see what the Industry as a whole proposes to do.

The explanation lies, I think, in the fact that we have,

for so long a period, devoted so much care and attention to the engineering side with its problems of works re-construction and distribution, and so little to the sales or management side of our job, that our business faculties, as yet, are not properly attuned or keyed up to present-day needs, with the result that, individually, we fear to make any move from the flat rate lest it prove prejudicial to our profit.

It is easy to be wise after the event, of course, but there can be no doubt that, in the past, we have failed to look sufficiently far ahead. To put it plainly, our management has comprised not much more than twopence or threepence on or off the selling price, according to the cost of coal and the revenue from residuals, and it has needed the push of the electricity industry with its persuasive and attractive tariffs to make us aware of the urgent necessity for a change in our methods of charging.

And now that we realize that a change is vitally necessary, the sooner we set about demonstrating to our consumers that we are out of the flat-rate rut, the better.

Competition now has reached that stage when live committees and boards of directors will look to their responsible officer to demonstrate that he is capable of organizing and successfully supervising an up-to-date sales policy. The long-awaited legislation which is to give the Industry elasticity of charges, if and when it comes, will not compensate for any lack, on the part of the officer referred to, of those business capabilities and that commercial acumen which will be needed in formulating such a tariff schedule for his particular area, as will enable electrical competition to be met successfully. Actually, fresh legislation will render those qualifications imperatively necessary, so profound is the change that has taken place in the marketing of our commodity.

It behoves us then to give early and careful consideration to this matter of tariffs with a view to the preparation of a schedule best suited to the needs of our own area.

There is evidence in abundance that our electrical competitor has great faith in the two-part tariff, and no wonder, for it is enabling him to obtain a goodly portion of our heating and cooking load, and to attract for lighting also many gas consumers who might well be kept if there were in operation a two-part gas tariff.

I am firmly of opinion, derived from actual experience, that we must counter this two-part electricity tariff by an optional two-part gas tariff. This should be done forthwith, and the brake put on our competitor's further depredations.

The fact that companies, for the present at any rate, cannot benefit in dividend by an average selling price must not, I venture to say, cause us to wait an indefinite length of time before adopting this and any other tariff which, while giving us a fair field in competition, still gives consumers equality of treatment in like circumstances.

"Safety-first" tactics are not suited to the pressing needs of the hour, and it were better to incur the possibility of a temporary loss of revenue by the introduction of new and attractive tariffs, than run the greater risk of losing altogether a larger portion of our business.

The Wellington Undertaking.

Little has been said in this address of the Wellington (Salop) Gas Company, and it is not my intention to go into details concerning our works, plant, or district. I should, however, like to give you some idea of what we are doing in this small agricultural town of 8500 inhabitants (including about 500 in residence at two colleges) with the usual small industries associated with towns of this character.

For the year ended Dec. 31, 1930, our sales (exclusive of 45¾ millions sold in the outer areas) were 105 millions, or, 12,353 c.ft. per head of population. Per consumer (2234) the figure is 47,000 c.ft.

These figures, of course, must be viewed in the light that, apart from fuel oil, we had a non-competitive field up to the end of 1930; still, they are, I think, sufficiently striking to afford convincing evidence that our Company is progressive.

There are few undertakings that can point to the opening of good-class showrooms as far back as 1907—24 years ago—yet the Wellington Directorate at that date purchased an island block of property in the centre of the town, and, at considerable expense, equipped it for showrooms, offices, workshops, and stores.

They were early in the field, also, in the important matter of maintenance of appliances. Such a scheme has been in operation for a period of eighteen years, and now that we are face to face with electrical competition, we are deriving the benefits of this service in the steadfastness to gas displayed by our consumers over a period of six months' intensive electrical "touting."

Vote of Thanks.

Mr. J. Stevenson (Long Eaton) proposed a hearty vote of thanks to the President for his address. Mr. Woodfine had, he said, shown in it that he possessed a thorough grip of the industry and its problems. He had dealt forcibly and clearly with the main questions that confronted them. Conditions were changing, and they wanted to-day men like the President who would face facts, and do as they thought best. With politics as they were to-day, they could get little help from the Government.

Mr. T. H. Poulson (Stafford) said he had known the President for many years, and had been struck with the go-a-head character of his works. He had acted on his own convictions. It was a pleasure to second the vote of thanks. [Applause.]

The President, acknowledging the vote, said he regarded the address as a simple expression of the thoughts of a general practitioner in a small town with regard to what was in front of the Industry. General practitioners had a many sided job, and being obliged to keep hold on the strings it was impossible for them to specialize in any one particular thing.

An Invitation.

Mr. R. J. Milbourne (Vice-Chairman of the Wellington Gas Company) said this was the first occasion in his long period of association with the Gas Industry that he had had the pleasure and privilege of attending one of their meetings. As recently he had been elected a member of the Institution of Gas Engineers, he hoped that the constitution of their Association would not be so cast iron as to keep him much longer outside. ["Hear, hear."] It was with very great pleasure that the Board of the Wellington Gas Company heard the news that the members had elected their Engineer, Mr. Woodfine, as their President. Mr. Woodfine had been connected with the Company for 25 years, and he (Mr. Milbourne) had been intimately associated with him in that business. Knowing, as he did, Mr. Woodfine's ability, zeal, and enthusiasm for the Gas Industry, he felt sure that under his guidance the usefulness of the Association would be fully maintained. It was his pleasure to invite the members of the Association to visit their President in his home and to inspect the gas-works, after which the Directors would be delighted to entertain them at luncheon. He (Mr. Milbourne) was also closely associated with a firm manufacturing gas plant, whose works were within a short distance of Wellington. He referred to Messrs. C. & W. Walker, whose Directors would feel honoured if the Association would visit them at Donnington, and go over the works, where they would subsequently have tea in the works pavilion. With the President's co-operation, the hosts would do their utmost to make the visit both interesting and enjoyable, and he trusted there would be a very large attendance.

DISCUSSION ON THE DOMESTIC USE OF GAS.

Introduced by Mr. Frederick Shewring, of Stratford-on-Avon.

The Gas Press for months past has devoted much space to the desirability of sustained efforts in maintaining and extending our sales of gas. At meetings of kindred Associations, papers had been read and discussed. Articles, letters, and cartoons have appeared, and Editors have contributed columns on the same subject. This afternoon our President has aptly emphasized its importance. Personally, I am depending entirely upon the information which members will contribute to the discussion to make our little talk of some real value.

As responsible officials of gas undertakings, the initiation of a sales policy suitable for our respective undertakings rests upon ourselves. Success or otherwise depends to a marked extent upon the energy and work we put into it, and the enthusiasm we stimulate among our distribution staff. The planning of a sales policy demands thought, and is not an easy task unless we are exceptionally receptive in mind and enthusiastic in action. We must, however, first be convinced before we can reasonably expect to convince others. The whole subject may be considered a psychological one, and can perhaps be best studied from the aspect of psychology applied to business. We can all recall some time or other having in our sub-conscious mind thoughts which have afterwards been made public, or commercialized, by others. Now, until each of us is satisfied that we have formulated a good sales policy, the matter must not be left in our sub-conscious minds. It must be uppermost in our conscious minds, and to awaken this consciousness there must be a stimulus of sufficient intensity. Moreover, we must take care that this awakening does not come too late.

I see no advantage in waiting for a central organization to do what we might press on with ourselves. Those who control the distribution of gas are in an infinitely better position to influence business in their area than any outside body. Nevertheless, we have always the B.C.G.A.

behind us to back us up in various ways, and I pay tribute to their most excellent work.

Now, are we apt to under-estimate the purchasing capacity of many of our consumers? I think we often are. We can all instance our surprise when we hear that a Mr. "So and So" has just installed electricity at a cost of £15 to £20, or possibly more. Something pleasing and artistic could probably have been done with gas at less expense. Our adaptability in formulating lighting schemes must be immediate and appealing; otherwise we cannot hope to get anything other than a negative result.

Home Lighting.

Dealing with home lighting, consumers generally may be divided into three classes:

There are those who are definitely wedded to electricity.

There are those who may be called the "unstable class." They use gas, but may change over any time. Cost or other factors deter them, or possibly they are not psychologically ripe for a change.

The third class are those who appreciate and prefer gas, and perhaps embody the poorer section of prepayment consumers, who for various reasons are likely to retain their present installations.

The ratio of these consumers must vary in different localities; but it is clear that, without neglecting the service due to the third section, an effort should be concentrated on section two with the view of retaining their lighting business.

The modernizing of old lighting systems and the introduction of switches should be pushed with persistence. Switches undoubtedly create a new interest for gas in the home. The enormous success of the positive switch campaign in many of the North of England towns certainly encouraged me in this direction. At Stratford, we fix them free on hire-purchase terms at 1s. 6d. per quarter, spread over two years. We endeavour to introduce pendants with concealed tubes and *minus* lever taps. The appearance of the fitting could be enhanced if a movable shield or boss were introduced to encase the valve and top portion of the burner.

I should welcome the members' views on the class of fittings they favour most for general home lighting. My views have already been expressed in an article in the "Gas Journal" a short time ago. Quite accidentally a few weeks ago I came across two copies of papers in booklet form which were read before District Associations as far back as 1922 and 1923. They are "Modern Gas Lighting" and "Vast Opportunities for Artistic and Efficient Gas Lighting," both by Mr. J. W. Lofts. These I re-read with interest, and can thoroughly recommend them to those seeking knowledge on this subject.

Water Heating.

There is an immense field for increasing gas sales in domestic water heating. This business should be advertised, canvassed, and pushed with energy. Most of us know that difficulties are encountered in introducing a gas circulating boiler to work in conjunction with the existing range. Customers often resent having the water pipes taken apart and the mess entailed thereby. In new houses where coke-fired boilers only are installed, and where the architect or speculative builder does not provide a gas heated circulator, I have come to an arrangement with our local builders for their plumber to fix on the flow and return pipes to the coke boiler pitcher tees and plugs, which we provide free of cost. This enables a circulator to be introduced at a later stage without difficulty and at small expense. It is in the hot weather that the heat from the coke boiler or range causes discomfort, and this is the time—opportune time, I should have said—for the distribution official to make a call.

Thermal storage heaters for sinks, wash basins, &c., where a hot-water system is not installed, is a load well worth cultivating. These appliances supply a want and give satisfaction to users.

I must leave the many other interesting features of the domestic load to those who will speak later; but before concluding, I may mention that my Committee have instructed me to fix as an experiment about 25 gas fires free of cost for prepayment consumers. If increased consumption follows to justify the outlay, my Committee will no doubt adopt the policy of providing free one gas fire for each approved slot consumer.

An Enthusiast in Keeping the Lighting Load.

The President (Mr. H. J. Woodfine) said they could not hear too much about the use of gas, in the face of the electricity propaganda going on all over the country. He was an enthusiast for keeping hold of the gas lighting load.

Mr. T. H. Poulson (Stafford) said he had been hoping to hear something from Mr. Shewring about the gas unit. He thought that when they got the gas unit system adopted they would make greater headway with the domestic consumers. To his mind, monthly bills should be more extensively adopted than at present, in place of the old quarterly bills. One of the troubles they were up against in Stafford—and he thought in other places as well—was that people did not complain when they got a poor supply. Although maintenance men might go round two or three times, they still found people who put up with a poor supply of gas without making any complaint. One of the reasons wny some people went over to electricity was that electric light was either on or off, there was no poor light or anything of that kind. As to water heating, he had fixed some apparatus on hire. For each 20-gallon "Sunhot" they estimated the consumption of an additional 40,000 c.ft. per annum. Mr. Shewring mentioned that he was trying the policy of supplying one gas fire free to each slot consumer. For years in Stafford they had fixed gas fires free to slot consumers, and they had found that the consumption had greatly increased. He supposed the figure would be in the region of 12,000 to 15,000 c.ft. For quarterly consumers a very small charge was made, in order to induce people to take the gas.

Mr. R. S. Ramsden (Leamington) thanked Mr. Shrewing not only for his remarks on this occasion, but for the very informative and inspiring article contributed by him to the "Gas Journal" a short time ago. Probably most of them were now bringing the advantages of the gas switch to the notice of their customers, but its cost went against it. In the case of prepayment consumers, there was the objection that, if the by-pass went out when the pennyworth or shilling's worth of gas was exhausted, some people might not have sufficient thought to light the by-pass again, and there would be complaints of an escape of gas.

Gas Better than Electricity to Read By.

Mr. W. S. Morland (Gloucester) said that for lighting he had always been convinced that gas was superior to electricity. One could read by it for a longer period without tiring the eyes than one could do with electricity.

Mr. F. C. Briggs (Dudley), referring to Mr. Shewring's experiment of fixing a gas fire free to each prepayment consumer, said he had had experience recently of two exactly similar estates. One had a cooker and gas lighting, the other a cooker and a gas fire. They had not run more than twelve months, and the tenants might not have got used to the fires; but the consumptions were 12,000 to 14,000 c.ft. for the cooker and gas lighting installation, and for the cooker and gas fire only 8000 c.ft. a year. He found that gas lighting of this type was worth 5000 c.ft. a year, and it was not by any means replaced by putting in a gas fire. It seemed to him that if they were going to put apparatus in, it had to be done at an economic price, which carried interest on outlay, depreciation, renewals, and so on; and if they worked this out fairly, it came to quite a healthy figure.

A Pressing Problem.

If they did not do this, of course, they came up against the problem—a very pressing one to-day—of how much money they were prepared to put down to secure (say) one million c.ft. in consumption. He could get hundreds of new consumers tomorrow, if he would give them either free fitting or prepayment installations. But the total amount of money he would have to provide for mains, service, meters, cookers, &c., would be considerably more per million than the total capital per million of his Company. The Electricity Companies were putting down cables for lighting only in small houses, where the profit could not possibly pay interest on the capital. One had either to put down this capital or to charge heavily to revenue, which was going to decrease the profit. This problem of capital was made even more pressing by placing things out on hire at very low rates. His Company had gone rather on the side of hire purchase, by which they were relieved of any capital expenditure for the increased business; and he thought this paid. They had put geysers out on short-term hire purchase, and this had increased their geyser output 100 p.ct. in twelve months. Had anyone present tried placing "Sunhot" boilers at so much per day—an all-in charge? He was wondering how it was going to affect the unaccounted-for gas, if they estimated the consumption. It was quite an interesting point. If a meter was fixed, this would again add to the capital cost bugbear. It was his opinion that within the next five or ten years the electricity supply undertakings would be up against troubles in regard to maintenance. They would find that the contractors had not been working primarily in the interests of the industry they were serving.

Mr. Arthur Roberts (Hereford) said he thought Mr. Shewring's idea of fixing pitcher tees in connection with hot water installations was a very good one. The question of putting out the "Sunhot" boiler on a daily all-in charge was at present under discussion by his own Committee, and in a report which he had recently presented to them he had calculated a daily all-in charge to cover the cost of gas, of fixing, 20 p.ct. of the cost of the boiler, and a figure for maintenance, and this worked out for the first year at 9d. a day—taking the gas at practically cost price. To arrive at the gas consumption, he had proceeded as follows: The boiler was rated to consume 10 c.ft. per hour full on, and he had taken the full-on time as 14 hours a day, and the by-pass time as 10 hours. He had allowed 21 days in the year for absence, so that the calculation was for 344 days per annum, and the consumption on this basis came out at just over 55,000 c.ft. It was their idea to put in a secondary meter, so as to meet the question of unaccounted for. At the end of one year, the fixing charge would be taken off the total to

arrive at the daily figure, which would reduce it from 9d. to 6½d. An alternative scheme was to put in an immersion apparatus, where there was a cylinder. In the first year the daily charge for this would be 8½d., and afterwards 6d., as against 6½d.

Increased Sales per Consumer.

The question also arose as to how much money one would be prepared to spend to secure the increased output. Judging by their experience over the last two winters, they were under the impression that in two years they could increase their output 44,000,000 c.ft. by the installation of further gas fires and hot water installations, and this would cost them about £9000. In September, 1929, they reduced the hire charges for gas fires by 50 p.ct., just when the electricity undertaking had been transferred from the Corporation to a Company, and since that date they had put out a further 1000 gas fires. They were quite hopeful that in another two years they could repeat this. In Hereford they were very much dependent upon domestic consumption, as their industrial output was about 1 p.ct.; and in four years they had increased their total output by 10 p.ct., while in the same period they had only increased the number of consumers by 6 p.ct. Thus it seemed that they had to look for increased consumption per consumer in places like Hereford. Their average slot consumption was 23,182 c.ft. for the last year, and the ordinary consumption 52,000 c.ft. per consumer. He believed that since 1914 the increase in consumption per slot consumer had more than doubled, and this was largely due to gas fires and boilers.

In his case the cost of lighting by gas and electricity for a slot consumer was about 1 to 4, but in spite of this they found that slot consumers had a tendency to go over to electricity. In the case of the last two or three housing schemes, electricity for lighting had been installed, in spite of the fact that the Corporation were prepared to put in gas free of all cost. In the matter of gas cookers they had gone in for a very intensive campaign on simple hire. They had just over 4500 cookers on hire. A large portion of these were getting obsolete, and twelve months ago it was decided to put the "New World" cooker on simple hire. They thought that by doing this they were to a great extent preventing people turning over from gas to electricity for cooking.

Mr. T. F. E. Rhead (Birmingham) agreed that the electrical people were probably in for a rough time later on, in consequence of poor installation work carried out by some of the contractors.

Mr. Poulson, referring to hire purchase arrangements, said they had been doing this system for twenty years past, but had found that even with hire purchasing they could not get many orders for "Sunhots," the reason being that, if a man had to pay £12 for a "Sunhot," *plus* £5 or £6 for fixing, it meant that he was not going in for a "Sunhot" at all, but probably for a "Triplex" grate. In order to avoid this, they were putting these boilers out on a low hire charge. Speaking from recollection, he thought the 20-gallon "Sunhot" was hired out by them for 6s. a quarter.

Mr. W. G. S. Cranmer (Willenhall) remarked that, with regard to maintenance, one of his greatest difficulties was the very cheap burner. To counteract this, they decided to provide a good class burner and fix it for slot consumers at 1d. or 2d. over cost price. They had been fixing well over 1000 a year for some years past, and it paid them well, but, of course, they did require attention. Men went round periodically to every house, and all burners were examined, cleaned, and adjusted. This also was giving great satisfaction. In spite of this, however, they were losing some consumers, and it had been their experience that in many cases the ability to use the current in connection with wireless had been a great inducement to change over. They sold fairly cheap gas in Willenhall, but he was not altogether satisfied that cheap gas would retain the consumers. One had to give them something else, and he would rather like to see a small increase on the gas and a greater expenditure in other directions.

Use the Best Burners.

The President said it would be agreed that they had had a very good discussion. With regard to the lighting load, he utilized thoroughly efficient burners. Samples of these Mr. Woodfine produced for inspection, with the remark that he had always gone in for advising the use of the best procurable. Good maintenance, good fittings, and good constant gas would largely stave off electrical competition.

Mr. Shewring, in the course of a brief reply to the discussion, said he estimated the average cost of providing gas fires for slot consumers—not large ones, because that would be a mistake, but a six-radiant fire—averaged about £2 fixed. Calculated on this sum, 10 p.ct. interest and depreciation would be 4s. per annum, which they would need to recover. As his differential (as compared with the price for power) was 1s. 9d. per 1000 c.ft., if he could get 3000 c.ft. consumption extra, he would have covered his capital outlay of 10 p.ct. on £2.

Mr. Poulson remarked that his figure of 12,000 to 15,000 c.ft. consumption for gas fires with slot consumers was not an average one, but in certain cases there had been an increased consumption to this amount.

A hearty vote of thanks was passed to Mr. Shewring, on the proposition of the President, seconded by Mr. Briggs.

London Juniors Visit Kent Colliery

A visit to the low-temperature carbonization plant and colliery of Messrs. Pearson & Dorman Long, Ltd., at Snowdown, near Dover, was paid by the London and Southern District Junior Gas Association, under the Presidency of Mr. T. H. Prater, of Margate, on Wednesday, March 11.

On their arrival at Snowdown Colliery, the Juniors were welcomed by Mr. Cooper, Electrical Engineer to the Colliery, while Mr. Cox, the Chief Engineer, later joined the party.

The colliery, which is not far from the village of Nonington, and is situated amidst the most beutiful country on the Canterbury-Dover section of the Southern Railway, extends to some two miles of workings, while the equipment, which is practically all electric, is probably the most modern in the country. The workers live in a model village in close proximity to the colliery, every facility for sport and social intercourse being provided.

Surface Plant.

The surface plant consists of electrical coal winding equipment, driven by an A.C. motor having a continuous rating of 2400 b.h.p. and a peak h.p. of 3400 b.h.p., together with an Illgner set with Ward Leonard control equipment supplying current to the motor.

Housed in the same building is the main switchgear for electric power supply to both surface and underground. This switchgear receives its supply at 3300 volts from an outside sub-station where the supply is received at 33,000 volts from an overhead transmission line running from the power station at Betteshanger Colliery. At the pit top the bogies are unloaded and loaded on to the cages by means of electro-pneumatic decking equipment. The pit shaft is 3100 ft. deep and the wind is completed in 65 seconds, the maximum velocity of the cage being 75 ft. per second, and the capacity of the winding equipment 1000 tons per shift.

In the electrical pit the winding is practically continuous. There are two cages in each pit, and as the one is being loaded at the bottom the other is emptied at the top. Each cage is double-decked, carrying two bogies of coal on each. As the cage reaches the top a safety gate is automatically lifted at either side, and the electro-pneumatic ram pushes two empty bogies into the cage, thereby forcing the two full ones out the other side. The cage is then ready to descend again, while the full bogies from the top deck platform run down an incline and meet those from the lower deck, whence all four are elevated up an incline by a moving chain over the weighing machine, where the amount of coal is checked by an employers' representative and a workers' representative. From here the bogies are again elevated up an incline to the tippler, where the coal is dropped on to the separators, the empty bogies passing right round on a circular line to the other side of the pit again.

After going through the separators, the various grades of coal pass along three slowly moving bands between two lines of boys, who pick out all the slate and other foreign substances before the coal finally passes over vibrating sifter into the railway wagons below. The dust and slack is collected from below the sifters and elevated to a further separating plant, where it is separated into three grades of slack, the smallest being as fine as flour.

Low-Temperature Carbonization Plant.

It was to make a more marketable article of this slack that the low-temperature carbonization plant was erected, though this was not in operation at the time of the visit. It has a capacity of 100 tons per day, together with a complete handling plant. The retorts are heated by the gas produced.

At No. 2 Pit the winding is done by steam engines receiving steam from Lancashire boilers fired by mechanical stokers. The safety devices on this installation have been brought to a great degree of perfection. The driver must not start the cages until he has received a signal from both the onsetter and the banksman, and should he wind too fast an automatic cut-out comes into operation and applies the brakes. Similarly, should he over-run the top or attempt to start the cages the wrong way an automatic arrangement prevents accidents.

The visitors also inspected the installation, which is in duplicate, of mine ventilating fans, which are electrically driven by 575-h.p. motors. The engineering shops and stores were also visited, and in every case it was noticed that provision was made for future extensions. Interest was displayed in the lamp-room, where the miners' safety lamps are re-charged and cleaned. A rather unusual piece

of plant was that for stone crushing. This apparatus delivers powdered stone which has to be sprinkled or sprayed on to the floors of the underground workings. Regulations enforce this dilution of the coal dust on the mine floor with powdered stone, as, should there be an underground explosion, the coal dust thus becomes a non-explosive mixture.

The colliery have their own locomotive for shunting purposes on their sidings, while there are also an ambulance station and clerical offices attached.

Vote of Thanks.

The President (Mr. T. H. Prater), at the conclusion of the inspection of the colliery, proposed a very hearty vote of thanks to the management for the most enjoyable afternoon they had spent. They were a little disappointed, he remarked, that it had been impossible for them to go down the mine and also that the low-temperature plant had not been in operation, but all they had seen had made their visit well worth while. They had been particularly interested in the coal cleaning processes, which affected them chiefly as gas engineers; the separation plant, too, was remarkably efficient, being of very recent design. They noticed how in every direction provision had been made for future extensions, and they felt that the Snowdown Colliery had been started in the right way, and it was their hope that it would be successful in the future.

Mr. W. R. Moger (Tottenham) seconded the vote of thanks, and endorsed what the President had said, remarking that they very much appreciated the manner in which everything had been explained.

Mr. Cox (Chief Engineer to the Colliery), acknowledging the vote of thanks, said it was very pleasing to have the London Juniors there. The mining of coal since Messrs. Pearson & Dorman Long, Ltd., had become interested in the matter had made great advances. At Snowdown they had to overcome certain prejudices that existed in connection with Kentish coal, and they were installing all the most modern plant. Their coal was not good gas making coal, though it could be used in retorts. Most gas retorts were designed primarily for the utilization of north country coal: but if local gas companies were to build suitable intermittent type retorts they would be able to make greater use of this Kentish coal.

The Juniors returned to London at 5.30 p.m., having tea at Canterbury on the way.

Western Junior Gas Association

THE SHOWROOM SALESMAN

By R. Farquhar, Showrooms Manager, Bristol Gas Company

[Meeting at Bristol, March 7]

We in Bristol are out to sell gas, and the education of salesmen is considered one of the means to this end. It has been our custom for the showroom staff to hold informal discussions at frequent intervals. By this means we can be sure that the junior salesman learns something about the goods he is selling, other than their size, price, &c. He is told as much as possible about their manufacture and fitting, and is generally encouraged to take an interest in the appliances. The Education Scheme of the B.C.G.A. is at his disposal, and our Barton Street (Distribution Department) Premises is open to any salesman or other employee of the Company. Here every type of gas apparatus may be examined and tested. Frequent lectures and demonstrations are also held at this depôt.

A Successful Policy.

A salesman is thus enabled to learn our method of distributing the goods and to see how the sale is brought to a satisfactory conclusion. We are then sure that (as far as the main facts are concerned) every assistant will deal with the customer in a similar way—in my opinion, a very important point. He is also encouraged to take an interest in the working of other departments. The success of the progressive policy adopted by my Company, followed by continuous service to consumers, is reflected by the sales returns, for both gas and gas appliances. These figures may be of interest.

The sales of gas for the past year—in spite of the exceptionally mild weather conditions—show an increase of 30 million c.ft. Over 60 p.ct. of the gas sold is used in daylight hours. The number of consumers in the district shows an increase during the year of 3746. The number of cookers on hire, up to Dec. 31, 1930, was 88,326—an increase on last year of 3764. In addition to the increase of hired cookers, 2236 high-grade enamel cookers were sold, either direct or on hire purchase.

Hire-Purchase System.—Over 8000 high-grade appliances have been issued on this system since its introduction two years ago, and the demand is well maintained.

Deferred Payment System (Prepayment Consumers).—3293 new consumers on existing mains have been connected during the last two years, and 3277 cookers were fixed on these premises, so that practically all these consumers use gas for cooking, while over 7000 lighting points were fixed. This system is now being extended to encourage the use of other domestic appliances, so that the poorest consumer can secure the benefits of gas service.

Our direct sales also cover over 2000 fires and radiators, 384 wash-boilers, 2687 complete lighting fittings, as well as a large number of industrial appliances, geysers, lamps, &c. No fewer than 10,946 sundry articles were sold in the showroom, The running of supplies, fitting meters, estimates, &c., dealt with by the fitting department amounted to 10,634.

Technical Knowledge.

In an endeavour to make the best of their own goods, some salesmen are tempted to run down those of their competitors. This not only reveals bad taste, but is generally regarded as the last resort of the incompetent. Even if the customer gives the lead in this respect, it is wise to be courteous and generous in reference to competitors. I have heard it put forward that gas is a sheltered industry, that our goods sell themselves, and that our customers do not want technical information. It is, however, only by knowing his goods intimately that a salesman can gain that self-assurance which is so essential. He has to answer questions and meet objections, and unless he is sure of himself he cannot win the confidence of his customers.

The salesman must therefore get all the technical knowledge he can, but should train himself to think of his goods in simple language, so that he may present technical facts without effort, in a way the customer will understand. The salesman who lets his technical knowledge get the better of him usually loves argument, or else makes speeches at his customers, which may amuse or annoy them, according to their temperament, but rarely help a sale.

If you can sell the idea behind the goods, you help the customer to decide what he is looking for. You will be able to talk about the appliances in such a manner as to produce the maximum inducement to purchase.

All-Gas Demonstration House.

How to show our goods is almost as important as what to show. With this idea in view we have, during the past winter, run, in addition to a large annual exhibition in the Colston Hall (which was attended by 33,000 people), a series of cookery lectures and exhibitions in various districts, and an all-gas demonstration house. Of these, the house was perhaps the most effective, as well as the easiest to arrange.

The house itself, and the district in which it was situated, gave us the keynote. The fires, cooker, pendants, &c., were then selected to be in harmony. Very great care was taken that nothing too expensive or too cheap was shown, but all the goods were of the type which, experience has shown us, people who live in that kind of house would buy. Arrangements were made with a local firm to furnish the house throughout, and our shades, globes, &c., were chosen to tone with these furnishings and decorations. The gas equipment was very complete. The success of the venture may be measured by the fact that nearly 9000 people visited the house; and a large number of orders and inquiries have resulted.

Exhibitions present a more difficult problem. Here you have no house to act as a guide. You have, therefore, to display a considerably greater range of goods. Again, your large central exhibition has to appeal to people of all classes and tastes. This being so, the open type of stand is, in my opinion, to be preferred. The prospective customers may then see several types of fires, or cookers, with the minimum of trouble. Well thought out grouping is, of course, essential, if each object is to be seen to its best

advantage, but, with care, many effective results can be obtained. Another advantage with this type of stand is the ease with which the customers may be led from one part to another, without using crowded gangways.

The attendances at our winter exhibitions and lectures (to date) make the grand total of 50,000. This in itself is sufficient proof that the public take a lively interest in these demonstrations.

The house, or exhibition, having been carefully planned, your prospective customers now come to look round, and the salesman's real job begins. No one can measure the result of showing goods enthusiastically to casual visitors, even if they have no intention of buying. The visitors will probably receive such a pleasant impression of your goods and the services you are prepared to offer, that a demand will be created in their minds, and they will go to the showroom at some later date.

The constantly recurring problem at exhibitions of all kinds is whether to approach the visitor or wait until he comes to you. You may annoy him by an untimely offer of service, on the one hand; or, on the other, allow him to feel neglected. This point requires good judgment in every case. People vary temperamentally, and each presents a different problem. Some people walk on to the stand briskly; they have every intention of asking for what they want and getting it as soon as possible. These present no difficulties. Those who stroll leisurely about are a more delicate problem. There is always the risk that any advance may be resented. With these a friendly smile, and a "Please do look at anything that interests you" kind of remark, are usually successful. But the visitors who, when looking round, are careful to avoid catching the assistant's eye, should be left alone until they make the first advance. In all cases, when the salesman resolves to talk to the customer, he will be wise to do so as quietly as possible and with a friendly rather than a business-like manner. Most people seem to have a nervous fear of the smart salesman, thinking, no doubt, that they may be manœuvred into buying something they do not want.

Discussion.

The PRESIDENT (Mr. A. Barrett, of Frome) said that small undertakings were at a disadvantage when compared with larger ones, as they had not the experienced canvassers and salesmen to counteract electrical canvassing. He thought it would be of great assistance if a qualified salesman could be employed by a combination of small undertakings to go over each area in turn.

Mr. H. W. WILLMER (Bath) mentioned that electrical competition was not confined to the well-to-do classes. He considered that a sound system of maintenance would keep gas consumers satisfied.

Mr. T. B. ARMITAGE (Cheltenham) said he was pleased to note that Mr. Farquhar had stressed the necessity for salesmen to have technical knowledge.

Mr. J. CONWAY (Bristol) laid stress on the help the showrooms salesman could be to the outside staff.

Mr. S. B. JONES (Clevedon) considered that the all-gas house was an excellent means of publicity, and one that could easily be adopted by smaller undertakings.

Mr. J. H. PYE (Clevedon) appreciated Mr. Farquhar's reference to the necessity for technical knowledge.

Mr. FARQUHAR, in the course of his reply, stated that the all-gas house at Bristol had been very successful, and that as a definite result they had had many orders at the showrooms. The hire-purchase system, started two years ago, had been very successful, and the appliances sent out had been over 8000.

A hearty vote of thanks was proposed by Mr. C. BATEMAN (Bath), who remarked that, on account of keen electrical competition, every salesman should be able to quote the definite comparative costs of gas and electricity for each domestic requirement at the prices prevailing in their district. Many salesmen were not acquainted with these figures. In cases where electricity was sold on the basis of a standing charge *plus* a flat rate per unit (this was ½d. per unit in Bath) it was not quite correct to make the comparison on the basis of the charge per unit; nevertheless, this is the figure one must work on for further business.

In seconding the vote of thanks, Mr. B. F. HARRIS (Trowbridge), recommended a thorough canvass of all consumers as the only method of combating changes from gas to electricity. This would involve considerable expense, but the results would justify the cost.

After the meeting, the members were entertained at tea by the Bristol Gas Company.

Scottish Junior Gas Association (Western District)

Visit to Uddingston Gas-Works

On Saturday, Feb. 21, about ninety members of this Association visited Uddingston Gas-Works, where they were cordially welcomed by County Councillor J. Wilson Paterson (Bothwell), Mr. Thomas Royden, General Gas Manager for the County of Lanark; and Mr. D. D. Melvin, Manager of the Uddingston Gas-Works. The party were divided into sections and, accompanied by guides, were conducted throughout the various departments, the numerous improvements and developments being explained en route.

The Uddingston Gas-Works were acquired by the County Council of Lanarkshire in 1921, as their first step in their scheme to amalgamate the gas-works in the Middle Ward area; and to-day, the works under their control are: Bellshill, Blantyre, Bothwell and Uddingston, Cambuslang, Carfin, East Kilbride, Holytown, Larkhall, and Stonehouse, of which only two—Uddingston and Cambuslang—are now manufacturing gas, the remainder being supplied with gas, under high pressure, from one or other of the manufacturing centres.

Uddingston will always be noteworthy for the researches there carried out by the Research Sub-Committee of the Gas Investigation Committee of the Institution of Gas Engineers, whose Fourth Report was presented to the Institution in 1920.

MANUFACTURING PLANT.

The retorts are of the Glover-West vertical type, the heating arrangements of which are eminently suited for the production of a gas of 400 B.Th.U. per c.ft. The bench consists of thirty-two retorts in four beds of eight which are arranged and heated in units of fours. The retorts are 20 ft. 6 in. long, oval in cross-section. They were designed for a nominal throughput of 3¼ tons of Scotch coal per day, without steaming. The present throughput is 3 tons 6 cwt. per day. The plant is capable of producing 2 million c.ft. per day of 400 B.Th.U. gas. Waste-heat boilers, working on natural draught, are in operation on Nos. 1 and 4 Beds. There are four producers, one for each bed; and these may be operated on natural draught or by steam blowers should this be necessary. The coke extractor gear is operated by one central driving system, the power for which is obtained from a horizontal steam engine—a 6-H.P. gas engine acting as a stand-by.

COAL AND COKE HANDLING PLANT.

The coal is elevated by means of a gravity bucket conveyor to the overhead bunkers. No breaker is installed, washed nuts being used exclusively. The coke is handled by a lip bucket conveyor which carries it to the coke bunkers or producer bunker as required. This conveyor can also handle coal in case of emergency. A Morris runway and skip is provided on the stack platform for filling retorts with coke after scurfing. A 20-cwt. hoist completes the arrangements for handling material, and is normally used as a service elevator for access to platforms, &c.

The steam-raising plant consists of three Lancashire boilers. They are fitted with Meldrum furnaces and burn a mixture of breeze and gum. The feed water, as mentioned before, comes from the condensers and is further preheated in a Weir feed heater by exhaust steam.

The electric power used on the works is generated by either of two 36-H.P. "National" gas engines direct coupled to 24-KW. generators. The lighting of the retort house is derived from a small 2½-KW. generator belt driven from the line shafting driving the coke extractor gear.

The laboratory is larger than that found in most works of this size, and is equipped with all the necessary apparatus for coal, gas, and bye-product testing. Provision is being made at present for the installation of a "Sigma" B.Th.U. recorder, which will be used for official gas testing.

Gas is supplied from Uddingston under high pressure to the following centres: Bellshill 2¼ miles distant, Holytown 4½, Carfin 6¼, Larkhall 7⅜, and Stonehouse 11¼, and also to several small villages.

Three compressors are in use:

(1) A rotary compressor, capacity 50,000 c.ft. per hour against 2½ lbs. pressure at 108 r.p.m.

(2) A rotary compressor, water cooled, capacity 80,000 c.ft. per hour against 5 lbs. pressure at 88 r.p.m.

(3) A vertical reciprocating compressor, capacity 150,000 c.ft. per hour against 15 lbs. pressure at 325 r.p.m.

WORKING RESULTS.

The coal used in these works is Lanarkshire washed

doubles 75 p.ct. of which comes from one colliery. The average approximate analysis as received is:

Moisture	10·7 p.ct.
Volatile matter	32·5 ,,
Fixed carbon	52·4 ,,
Ash	4·4 ,,
	100·0 ,,

The carbonizing results are as follows:

—	Year Ended 15/5/30.	15/5/30—31/1/31.
Make per ton, c.ft.	20,373	20,449
Calorific value, B.Th.U.	403	405
Therms per ton	82·1	82·8
Tar per ton	21·7 galls.	21·4 galls.
Screened coke sold per ton	6·5 cwt.	6·4 cwt.
Sulphate of ammonia (neutral) per ton	36 lbs.	35·6 lbs.
Coke used at producers (lbs. per 100 lbs. coal carbonized)	17·2	16·8

These figures show how results can be maintained consistently over long periods when coal supplies are regular in quality.

At the close of the inspection the party adjourned to the Masonic Hall, Uddingston, where high tea was served. County Councillor Owen Coyle (Cambuslang), who is Chairman of the Gas Committee of the County of Lanark, presided, and along with him at the head table were: Mr. Thomas Royden, Mr. D. D. Melvin (President of the Association), Mr. A. M'Donald, Deputy Manager, Gas-Works, Motherwell (Vice-President), Mr. M'Whirter (Member of Gas Committee), Mr. D. Fulton, Manager (Helensburgh), Mr. J. Murray (Past-President of the Association), Mr. A. Bujnowski (Secretary), and Mr. Poulson (West's Gas Improvement Company).

The CHAIRMAN said: As Chairman of the Gas Committee of the County of Lanark, it is my privilege to express our pleasure in welcoming you here to-day. When the request was made to my Committee for your Association to visit the Uddingston Works during the presidential year of Mr. Melvin, it was granted unanimously and most cordially. The members of the Committee feel that an honour has been conferred on them by your electing Mr. Melvin to your chair and feel confident, from their knowledge of Mr. Melvin, that the right man has arrived in the right place. Many people nowadays are going around prematurely ringing the death knell of the Gas Industry, but, so long as the Industry attracts young men willing to sacrifice their leisure in pursuit of improvement, so long will our competitors find the Industry a very lively corpse. Much can still be done by the gas profession to meet present-day conditions, in the way of salesmanship, attractive charges whereby the consumers may increasingly use gas for still more purposes, and wider attention to the maintenance of apparatus in consumers' premises. The cheapening and improving of the manufacture of gas can do much, but constant attention must be given to going out for a wider market, and giving that market satisfaction when it is found. I am glad to know that these points are, at present, occupying the attention of the Industry and trust that ways may be found to a great future for gas. Your Association can do invaluable work in both the manufacture and distribution of gas, and should be encouraged in every possible way. The best proof of the benefits of your Association is in the list of past and present members who now hold responsible positions in what is undoubtedly one of the most important professions in our present civilization. One only realizes the importance of the profession, when one considers how very few branches of our modern life are not assisted in some way or other by the Gas Industry. The Committee are jealous of the good name which the Uddingston Works have always enjoyed, and are confident that under the guidance of our General Engineer and Manager, Mr. Royden, the Works Manager, Mr. Melvin, and his Assistant, Mr. Robb, together with their able and willing staff, that good name is not likely to be lost in the slightest degree.

Mr. M'DONALD (Motherwell), as Vice-President of the Association, in acknowledging their indebtedness to the Gas Committee of the County of Lanark for a pleasant and instructive afternoon, said: This is the first time we, as an Association, have had the privilege of visiting the Uddingston Gas-Works, and I do not think one of us has been disappointed. We have found a thoroughly well-equipped works with which anyone might be proud to be connected. I think it would not be out of place to acknowledge our indebtedness to a number of our seniors, and in particular to Mr. Royden, the General Manager of the Middle Ward.

Mr. MELVIN said he wished personally to thank the Gas Committee and Mr. Coyle for their valuable help extended to him during his presidency of the Association.

The Formation of Cokes

By JOHN ROBERTS, D.I.C., Consulting Fuel Technologist

[From a Paper before the Institute of Fuel.]

The opening part of this paper deals with coking in beehive ovens, and describes the beehive oven, after which the author proceeds to a consideration of stalactites and stalagmites, hair carbon, and "fish roe" structures, concluding the first portion of the paper with a description of the characteristics of beehive coke Bye-product coke is next considered, this process avoiding the waste of bye-products of coal occurring with the beehive oven. The author then gives an analytical consideration to the formation of the coke, and factors influencing the quality of coke produced.

The nature and properties of the coke produced from bye-product ovens will depend on several factors—namely, the properties of the coal and its condition, the temperature of treatment, and the width of the oven, all of which affect the duration of the coking period. Considering these factors in the above order, it must be borne in mind that every coal calls for independent study. The best results cannot be expected unless the peculiar properties of a coal are closely scrutinized. Even with the best Durham or Welsh coking coals it does not follow that straight treatment in a standard modern type of coke oven will give either the maximum yield of furnace or foundry coke or the coke best suited for iron smelting. From a given coal the aim should be to produce a residue 100 p.ct. of which should be marketable as a main product, furnace coke, for example. Excessive development of columnar structure produces "fingery" coke, and a multiplicity of cross fractures causes the production of excessive fines, unsuitable for blast furnace work.

At this juncture it is advisable to outline briefly the stages in coke formation. The first stage is the fusion of the particles, and this is followed by the development of a plastic, or decomposition, zone, in which, should the binding agent be in excess of that required for the initial cementing of the particles of residue, the binder is decomposed, resulting in the formation of comparatively large cells. In the succeeding stage these cells are compressed, and contract, and in the fourth stage the already coherent mass is subjected to secondary cementation as the hydrocarbons become decomposed in their passage outwards through the coke.

UNIFORMITY IN TEXTURE.

The plastic zone influences the rate of heat transmission in the process, as well as the character of the final product. Where excessive development of plasticity is not allowed to take place the coke will consist of a residue containing innumerable small cells of great uniformity in size. This coke was made in coke ovens from coal which had been washed by the flotation process. In this case the size of the coal has also exercised an influence. The chances of securing uniformity in texture are enhanced by using coal which has passed through (say) a ¼ in. mesh.

This is mainly accounted for by the fact that most coals contain three or four constituents having different coking properties. In a coking coal clarain and vitrain have the strongest coking propensities. The durain may be just fusible, or may be infusible. The fusain is non-coking. Vitrain and clarain generally swell strongly on fusing, but sometimes, as with low-volatile coking coals, these ingredients will fuse but not swell.

Excessive amounts of infusible ingredients do not make for uniformity in texture. It is not suggested that durain should be removed from the coal; its infusibility may in many cases be counteracted by reducing the size of the coal. The removal of the fusain and durain may occasionally improve the quality of a coking coal, but it must be

remembered that some good coking coals, like the No. 2 Rhondda, contain a large proportion of fusain, and it has been shown that in some cases a proportion of fusain is beneficial. What has been said regarding durain is also true in the case of cannels, some of which are fusible, while others are not. Sufficient has been said to show that if it is desired to manufacture a coke of uniform texture, due consideration must be given to the nature of the ingredients of which the coal is composed.

Carbonizing Temperature.

The temperature at which the coal is carbonized will influence the extent of the secondary cementation that takes place through the deposition of graphitic carbon in the coke. The nature of the hydrocarbons also play a part, as some are decomposed at lower temperatures than others. If it is absolutely essential that a carbon skin should protect the coke in the upper part of the blast furnace, then it is advisable to ensure that the maximum deposition takes place. That would be the only justification for allowing the coke to remain in an oven longer than would otherwise be necessary. In most cases a higher average carbonizing temperature than 750° C. would be necessary for this purpose, although it has been held by H. Koppers and others that a temperature range of 650° to 800° C. should be employed. If a coke made under the latter conditions would be equally as efficient in blast furnace work as coke made at higher temperatures, it would be inadvisable to reduce the flue temperatures proportionately; the desired effect could be obtained by preparing the coal in such a manner as would facilitate heat penetration. This can be accomplished by reducing the development of the heat-resisting plastic zone. In this connection the width of the oven would have to be taken into consideration to ensure that there was no premature decomposition or oxidation of the binder beyond the limit of efficiency, as might occur in a wide oven.

Gas Coke.

In the manufacture of gas the coke is regarded more or less as a bye-product of the process. For this reason insufficient attention has been paid to the quality of the solid fuel. This attitude can be understood when it is remembered that the distillation of coal in gas retorts is essentially a gas-making process, and greater revenue is obtainable for therms in the form of gas than in the form of coke. Even so, the fact that about ten million tons of gas coke is manufactured every year ought to be sufficient to warrant that a large proportion of it should be produced in the best possible condition. It can hardly be claimed that such a desirable stage has been reached, but there is evidence that the question of coke quality will receive greater attention in the future than it has had in the past. This is essential if the gas companies are successfully to resist the competition offered by furnace coke manufacturers, and meet the wide demand which will surely arise for a readily-combustible smokeless fuel.

Gas coke is made in retorts of various designs, including continuous verticals, inclined chambers, intermittent verticals, horizontals, and producer-type retorts. In the first type the charge of coal is not static during carbonization, but descends slowly from top to bottom as carbonization progresses. These conditions do not make for the production of dense compact cokes, but the systems employed possess other advantages which account for their popularity as gas-making plants. Static conditions prevail in types 2, 3, and 4, so that more compact cokes are produced in these systems. However, the writer is not sure whether there is much to choose between the various cokes as now made. Some consumers, especially those who buy in small quantities for use in the open grate, will express a decided preference for bulky coke, as they get a "larger bag" for the same price, and the chances are that such coke, being usually dry cooled, contains the lower proportion of water.

Much is being done in the way of grading coke to meet varying conditions of use. This is a move in the right direction. Its importance will not diminish even though improvements in methods of manufacture be introduced.

Free-burning High-Temperature Coke.

The President of the Institute, Sir David Milne-Watson, has indicated in his Presidential Address that he looks to high-temperature systems for the production of free burning coke, from the carbonization of selected, prepared, and blended coals. The work already done on a works' scale appears to indicate that success will be certain in this direction.

Brief reference may here be made to the experiments carried out at the Ramsgate Gas-Works in 1927 by the Woodall-Duckham Company, in conjunction with the author. In these tests intermittent vertical retorts were employed, and instead of using "straight" coking coals blends of coking and non-coking coals were used. The temperatures in the flues reached 1350° to 1370° C. The use of these non-swelling blends facilitated the penetration of heat through the charges, and enabled the retorts to be discharged in two-thirds of the normal coking time. The result was the production of a high-temperature coke having remarkable free-burning qualities, and one that could be kindled in the usual way in an ordinary open grate. The volatile content was about 4 p.ct. The author has long maintained that similar results can be obtained in suitably dimensioned coke ovens, and it is noted that the Director of Fuel Research has this system in view in connection with the proposed installation of coke ovens at the Fuel Research Station.

Blending and Oxidizing Process.

The process and experimental results have been fairly fully described elsewhere, but it may be outlined briefly as follows. The system consists in carefully blending strongly-coking coals with non-coking or high-oxygen coals, and carbonizing at the highest available flue temperature, until the middle of the charge reaches a temperature of about 550° C. The coke is then discharged, cooled, and graded. Any breeze below ¼ in. that is produced can be returned to the retort, replacing an equal weight of non-coking coal, so that the whole of the coke made may be marketable.

When this process was developed conditions were foreseen in which there might be available only one coal, and that of the strongly-coking variety. Therefore, provision was made for taking (say) one half of the coal supply, oxidizing it at a temperature between 100° and 350° C., until its coking properties were destroyed or considerably reduced, and then mixing this oxidized or artificial non-coking coal with its own weight of, or in other suitable proportions with, the untreated coking coal. The blend would then be carbonized in coke ovens or other suitable retorts at temperatures above 600° C. This system is to be tried out in France in coke ovens on a large scale in the near future, and from trials already made there appears to be little doubt that success will be achieved.

Although the writer is naturally keenly interested in the process just outlined, and has good reason to have strong faith in it, he does not by any means consider that it is the only method of solving the domestic fuel problem. Low-temperature carbonization is bound to come more and more into the argument, in spite of many technical and financial failures already on record.

In conclusion, the author points out that it must not be assumed that because the production of high volatile semi-coke is advantageous in low-temperature practice it is essential from the combustibility standpoint to have high volatile contents in the fuel. On the contrary, the percentage may be as low as 4, yet the combustibility will be perfectly satisfactory, so long as the texture of the fuel is right, as will be gathered from the discussion of gas coke manufacture in the paper. Gas companies can still make free-burning coke at high temperatures, as can also coke oven operators, while those who have no ready outlet for gas should leave as much as possible in the smokeless fuel, by treating coal at low temperatures.

There need be no antagonism between the sister industries as long as the ultimate aim is the abolition of the use of raw coal in domestic grates, and the abatement of the smoke nuisance.

Southgate and District Gas Order

An application by the Southgate and District Gas Company for a Special Order under section 10 of the Gas Regulation Act was inquired into at the offices of the Board of Trade in London on Friday, March 13, by Mr. H. L. SPENCER, of the Gas Administration Department, in the absence of the Director of Gas Administration, Mr. J. F. Ronca.

Mr. S. G. Turner, K.C., appeared for the Southgate and District Gas Company, while the only two opponents, the Middlesex and Hertfordshire County Councils, were represented by Mr. H. F. Bidder.

Mr. TURNER, for the applicants, explained that the Draft Order dealt with the Company's scheme for pensions, and sought certain modifications in regard to the powers under which the present scheme had been operated. In a few brief particulars of the history of the Company, he said that it was incorporated in 1866, and had since obtained other Acts and Special Orders. In 1912, the Company obtained an Act authorizing the establishment of a fund from which could be obtained pensions, retiring allowances, and superannuation allowances. This scheme applied only to the weekly workers and not to the salaried staff, and was on a non-contributory basis. By the terms of the Act of 1912, the Directors of the Company were allowed to contribute an amount each year to the value of 0·1d. per therm of gas supplied in that year provided that the total amount of the fund did not exceed five years' full contributions at the rate of 0·1d. per therm on the gas supplied. It became apparent to the Company a few years ago that the fund was not solvent, and an actuarial investigation was carried out which showed this to be the case. The liabilities under the fund had become very much greater than had been anticipated in 1912; and while all employees engaged before 1929 had been given the benefit of the scheme—it was not definitely a term of employment although a notice to that effect was exhibited about the works—it had become necessary to render the scheme inoperative as from Dec. 31, 1929, in regard to new employees.

The main object of the present Draft Order, continued Mr. Turner, was to remove the limitations upon the amount which the Directors could pay into the fund, and to enable the Company to put into operation a contributory pensions scheme which would bring in both the weekly workers and the salaried staff. The report of the actuary on the position of the pensions scheme at present was that it would require a sum of £2210 per annum for a period of 45 years to provide for the existing pensions, taking into consideration the balance at present standing to the credit of the fund, equivalent to 1·37d. per 1000 c.ft., which was a considerable increase on the amount which the Company was authorized to pay into the fund under its Act of 1912. The Company asked the Board of Trade to allow a reasonable time to put the fund into a sound position and to sanction a new scheme on a contributory basis for all employees. On general grounds, it would prefer that a period of less than 45 years should be allowed.

The new scheme would be registered under the Superannuation and Other Trust Funds (Validation) Act, 1927, and that being so, involving as it did a considerable amount of supervision, the Company felt justified in asking the Board of Trade to remove the present limitations and to give the Directors the same freedom of action in regard to pensions that had been granted to a number of other companies, both sliding scale and maximum dividend companies. The Southgate Company was a maximum dividend Company, but there were precedents for the present proposal in both cases. By the registration of the scheme there must be, at least once in every five years, an investigation and a report by an actuary.

Dealing with the objections of the Middlesex and Hertfordshire County Councils, Mr. Turner said the fear seemed to be that, if the Company were granted these powers, the Company would do something detrimental to the interests of the consumers, although the opponents did not object in principle to pensions schemes. It was asked by the opponents that any scheme adopted by the Directors should be submitted for the approval of the Board of Trade, but there was no precedent for such a suggestion, and he claimed that the Directors of the Southgate Company could be trusted to carry out the powers in a manner which would be fair to both the consumers and the shareholders. The point made by the opponents seemed to be that a maximum price would be more likely to act against the interests of the consumers than would a company operating under the conditions of the sliding scale, but he could not see any difference between the two sets of conditions. It was not without interest, he added, that when the Hertford Gas Company was given these powers, the County Council did not oppose with regard to them.

Mr. *H. C. Burton*, Secretary of the Southgate Gas Company, the North Middlesex Gas Company, and the Brighton and Hove General Gas Company, after confirming the statement made by Mr. Turner, said the intention was to place the facts before the employees at present within the pension scheme—if the Order were passed—and ask them voluntarily to give up their non-contributory pensions and come into the contributory scheme. As regards the employees coming within the existing scheme, it was proposed to ask them for a contribution on the basis of 3 p.ct. of their wages, but others would be asked to contribute 3 p.ct., 4 p.ct., and 5 p.ct. according to age. The Company would contribute (say) 5 p.ct. for the first few years, in order to place the fund on a strong basis, and reduce the amount to 3 p.ct. according to circumstances.

Cross-examined by Mr. Bidder,

Witness said that under the existing pensions scheme the weekly workers were entitled to a pension on reaching the age of 65 years and if they had served 20 years with the Company. The pensions were on the basis of 1/60th of the average weekly wages over a period of ten years prior to retiring, for every year the employee had been with the Company.

Mr. BIDDER suggested that there might be an incentive to a maximum price company to keep up the price of gas, pay the maximum dividend, and pay large sums into the pensions fund, to the detriment of the consumers.

Witness said the Company could have refrained from reducing the price of gas during the past two years and put money to reserve, but it had not done so, and although the maximum price was 14·8d. per therm, the actual selling price was 9·9d. per therm.

Mr. BIDDER next suggested that if the Company paid off the deficiency on the present scheme in a relatively short period of years, that would operate to the detriment of the consumers.

Witness said the question of that period was a matter for the Board of Trade.

On behalf of the Middlesex and Hertfordshire County Councils, in opposition,

Mr. W. B. KEEN, Chartered Accountant, was called. His point of view—which it was afterwards stated was his own personal view, and not the official view of the opposing Councils—was that the Southgate Company should continue with its present scheme, but cut down the scale of pensions in order to make them fit in with the financial position. Only in that way would the Company be prevented from charging too high a price to the consumers in order to finance the pensions scheme. He expressed doubts, also, whether the 3 p.ct. and 5 p.ct. contributions proposed to be contributed by the employees and Company respectively would make a contributory scheme financially sound, and he said that, although he could not remember specific cases, he had heard of instances where even a 10 p.ct. combined contribution had proved insufficient. If necessary, too, the Company should reduce its dividend in order to make the present scheme sound.

Mr. *F. W. Rattenbury*, County Accountant, Middlesex County Council, made the point that it was possible for a maximum price company to pay its maximum dividend and at the same time pay unduly large sums to a pensions fund while not reducing the price of gas, thus penalizing the consumers. The Council would not object to any pensions scheme devised on different lines from the one proposed—one that would be subject to the approval of the Board of Trade and one which did not permit the Company to pay off the liability on the old scheme in too short a period. Generally speaking, contributions aggregating 10 p.ct. had been found to meet the demands of pensions schemes, and that was the basis on which the pensions scheme of the Middlesex County Council was managed.

In cross-examination, Mr. Rattenbury said he would not go so far as Mr. Keen in suggestion that the requirements of the Company's Act of 1912 were sufficient in the present circumstances. At the same time it was felt to be distinctly unfair to the consumers to give a Company the unlimited powers now asked for.

Mr. TURNER, speaking on behalf of the Southgate Gas Company, said the two County Councils were asking for the creation of a precedent.

Mr. BIDDER said the precedents referred to in the case of maximum price companies had been established in an unopposed Bill in one case, while the fact that the Hertfordshire County Council had not opposed when the powers were granted to the Hertford Gas Company did not imply that the County Council on that occasion had agreed. The circumstances of each case must be taken into consideration, and views must be expected to change according to the circumstances.

The inquiry closed.

Legal Intelligence

Co-Partnership in the Courts.

In the King's Bench Division on Thursday, Mr. Justice Roche heard the settlement of an action *Greenwood v. The South Suburban Gas Company*, which was said to be a claim in connection with an alleged co-partnership agreement.

Mr. CROOM JOHNSON, K.C., stated that the action raised questions of law and fact which would be difficult of construction, as well as a lot of other points. Defendants had been good enough to meet plaintiff in a way that was very satisfactory, and certain money in Court would be paid out to plaintiff. The costs would be taxed in the usual way.

His Lordship, acquiescing in the settlement, said that one heard so much about the success of co-partnership schemes that an action about one would have been interesting to try.

PARLIAMENTARY INTELLIGENCE

[From Our Special Correspondents.]

House of Lords.

Private Bills.

The opposition to the Gas Light and Coke Company Bill has been withdrawn, and the Select Committee appointed to consider it has therefore been discharged. The Bill will now go to the Committee on Unopposed Bills.

The Lowestoft Water and Gas Bill has been reported with amendments from the Select Committee, and is now awaiting third reading.

Special Orders.

The following Special Orders have been laid before the House and referred to the Special Orders Committee: Alnwick Gas Company, Croydon Gas Company, and Watford and St. Albans Gas Company.

Lowestoft Water and Gas Company's Bill.

This Bill (see "JOURNAL" for Jan. 14, p. 105) was before the Unopposed Committee of the House of Lords on Tuesday, March 10, and was ordered to be reported for third reading. With regard to the area of supply for gas by the Lowestoft Company, the Bill as originally deposited provided for its extension to include the parishes of Hopton, Corton, Flixton, and Blundeston, in the County of East Suffolk. This has been amended, however, so that the parish of Hopton is not to be included, and part of the parish of Corton is not to be included. The area to be added to the gas limits, therefore, will be the parishes of Flixton and Blundeston, and part of the parish of Corton.

House of Commons.

Private Bills.

The petition of the Reading Gas Company against the Great Western Railway Bill has been withdrawn.

The Standing Orders Committee, having heard a petition from the Aldershot Gas, Water, and District Lighting Company for an additional provision in its Bill, has recommended that the parties be permitted to insert their additional provision if the Committee on the Bill think fit.

The following Committee has been appointed to consider the Guildford Gas and Electricity Bill: Sir Robert Young, the Rev. Herbert Dunnico, Col. Spender-Clay, Mr. Charles Brown, and Mr. Smith-Carington.

Coal Used at Gas-Works.

Mr. G. MACDONALD asked the Secretary for Mines the quantity of British coal used in this country in the process of extracting oil during each of the last three years ended Dec. 31, 1930.

Mr. SHINWELL, in reply, said that at present no plant was being operated in this country on a commercial basis primarily for the extraction of oil from coal. Coal tar and coal tar oils were obtained as bye-products in the carbonization of coal at gas-works, bye-product coke ovens, and low-temperature carbonization works. In addition, benzole was obtained from the gas produced at a large number of these works, and smaller quantities in the process of distilling the tar. It was estimated that 45-48 million gallons of crude benzole, yielding about 32 million gallons of motor fuel, were produced in 1930, chiefly from gas produced at coke-oven plants. In addition, creosote oil, for use as oil fuel, was obtained from the distillation of coal tar. Estimates for 1930 were not available, but in 1929 about 320,000 tons of creosote oil were obtained from the distillation of about 2 million tons of crude coal tar.

Aldershot Gas, Water, and District Lighting Bill.

Application for Additional Provision.

With a view to clarifying the position as to the powers of Government Departments to deal with the capital of companies supplying electricity and water in addition to gas, the promoters of the Aldershot Gas, Water, and District Lighting Bill applied to the Standing Orders Committee of the House of Commons on Tuesday, March 10, to dispense with the Standing Orders, so that an additional provision could be made to the Bill. (The Chairman of the Committee is Sir Robert Young.)

The Aldershot Company supply gas, water, and electricity. The Bill, as originally deposited, contained provisions framed to enable the Board of Trade or the Electricity Commissioners, after consultation with each other and with the Ministry of Health, to deal effectively by means of a Special Order with the capital of the Company (notwithstanding that such capital was applicable to all branches of the Company's undertaking), so avoiding the necessity for separate applications to three Departments. Since the introduction of the Bill, however, a question arose which indicated that the provisions inserted were not wide enough to attain the object aimed at. The Board of Trade has been advised that it is doubtful whether it is within the powers of the Board to make Special Orders with regard to the Company's capital, as that capital is not solely applicable to gas purposes. The Company submitted, therefore, that it was expedient that both the Board of Trade and the Electricity Commissioners should have power, after due consultation, to deal effectively with any matter arising out of an application by the Company for additional powers.

With regard to the water undertaking of the Company the difficulty does not arise, as any Departmental action by the Ministry of Health in the case of a water undertaking is by Provisional Order, in which case confirmation by Parliament prevents any question of *ultra vires* arising.

The provision which it is desired to insert in the Bill is to the effect that, notwithstanding that the Company are authorized to supply water and electricity as well as gas, the Board of Trade may make, under Section 10 of the Gas Regulation Act, 1920, any Order with regard to the Company or their capital or the undertaking which that Board would be authorized by that Act to make if the Company had been authorized to supply gas only, but that before making any Order not limited to the Company's gas undertaking, the Board shall consult with the Minister of Health and the Electricity Commissioners.

There is also a similar provision giving similar powers to the Electricity Commissioners, after consultation with the Minister of Health and the Board of Trade.

The Company sought also to insert further provisions to clarify the position as to the Board's powers to give consent with regard to the offer of stock for subscription and other matters affecting capital.

In response to the Chairman's request, Dr. C. F. T. Blyth (of Messrs. Blyth, Dutton, Hartley, & Blyth, Parliamentary Agents) explained that doubt had arisen as to whether certain sections of an Order made in 1925 by the Board of Trade were valid. It was considered desirable, therefore, not only in the interests of the Aldershot Company, but also in the general interests, to clear up any doubt with regard to the powers of the Board to deal with the matter.

The Committee agreed to the suspension of Standing Orders.

Great Western Railway Bill.

Reading Gas Company's Petition Withdrawn.

The petition lodged by the Reading Gas Company against the Bill promoted by the Great Western Railway Company was withdrawn before the Bill reached the House of Commons Committee on March 10, the Gas Company's objections having been met.

The point at issue was the possible damage to gas mains of the Company, resulting from the use of land which the Railway Company sought to acquire for the purposes of sidings. This land is adjacent to the railway track, and the traffic passing from the railway track to the sidings to be constructed on this land will have to cross a right-of-way below which the Reading Gas Company's mains are laid. The Railway Company have agreed to provide the necessary strengthening to prevent damage occurring to the mains, and, in view of this, the Gas Company's petition was withdrawn.

REGISTER OF PATENTS

Complete Gasification.—No. 341,370.

HUMPHREYS & GLASGOW, LTD., and GRIGGS, A. R., both of Westminster.

No. *13,909; May 6, 1930.

The object of this invention is to enable the carbonization of the coal to be assisted by heat conducted through the wall of the carbonization chamber of the upper part of the generator. A complete gasification process according to the invention is distinguished by the fact that the heat of the blast gases led off from the coke is at least partly utilized to heat a recuperative chamber surrounding the carbonization chamber. In making a down run through the coke the steam may be superheated by passage through the recuperative chamber in counter-current direction to the flow of blast bases therethrough, while during an up run with saturated steam or steam not superheated in the chamber some of the blue water gas produced may be burned in the recuperative chamber, so as to increase the heat conducted through the wall of the carbonizing chamber. The amount of heat applied in the carbonization of the coal can be varied within wider limits than usual to suit the quality and condition of the coal being dealt with.

European Gas Company, Ltd.

Annual General Meeting

The Annual General Meeting of the Stockholders of the European Gas Company, Ltd., was held at noon on Tuesday, March 10, 1931, in the Middlesex Room, Great Eastern Hotel, Bishopsgate, London, E.C. 2. The CHAIRMAN (Dr. Charles Carpenter, C.B.E., D.Sc., M.Inst.C.E.) presided.

The notice convening the meeting, and the Auditors' certificate as to the accounts, were formally read by the GENERAL MANAGER AND SECRETARY OF THE COMPANY (Mr. F. Eliot Williams, O.B.E.).

The CHAIRMAN prefaced his remarks upon the Directors' Report and Accounts for the year 1930 by reminding the stockholders of the extent of the business carried on by the Company. It owned concessions, he said, for the supply of gas to various cities and towns of France, a list of which was given on the front page of the circulated Report. In some cases it had a monopoly of supply; in others it shared the concession with another undertaking. Bolbec, Boulogne, Caen, Havre, Nantes, and Sotteville were in the former category; Amiens and Rouen in the latter.

In most cases the area of supply extended beyond the city to adjoining, or near-by, communes. The concessions expired at various dates. The longest—Nantes—ran on until 1978; the shortest—that of Amiens—had only five years to run. The case of this latter town was the only one in which the Company had not been able, as yet, to arrive at an agreement for a post-war re-settlement of the terms of the concession.

As opportunities arose, the Company extended its limits of supply beyond the nuclei of the towns to the outlying communes, which, as the stockholders were aware, were under separate municipal management.

The Board had continued their policy of adding to the Company's area of supply new districts which appeared to offer prospects of future development, and, as would be seen from the Report, contracts had been concluded for the supply of gas to a further Commune in the vicinity of Nantes, and to the estate of Hardelot, near Boulogne, which was being laid out and developed as a watering-place. The revenue from these new districts, of course, was small at first, but they should in course of time provide useful extensions of the Company's business.

Another instance was that of a contract which the Company had concluded with a neighbouring Company for the supply of gas in bulk to the latter from the Caen Works for a term of years; this was a development which had been rendered possible only by the additional powers which the Company obtained last year under its new Memorandum of Association.

Dealing with items in the balance-sheet in regard to which some explanations were necessary, the Chairman said that the item of Sundry Creditors in London showed an increase on the figure for the previous year, the 1930 figure being £66,893. The bulk of this consisted of the reserve for the Company's income-tax liability, which is now made in such a way that each year bears its own income-tax, and no year has to bear income-tax in respect of past profits. This remark, of course, was subject to the qualification that a reserve was not, and could not be, made to provide beforehand for increases in the rate of income-tax.

The loan from the Company's bankers had risen in the year from £25,000 to £55,000, the increase being entirely accounted for by the increase in stocks of various materials and apparatus and in sundry debtors, the latter item consisting to a very considerable extent of money due for coke and tar from public authorities, and, therefore, of perfectly secure debts. Public authorities were not in the habit of settling their obligations with the same rapidity as other customers. The larger stocks were due to the present difficulty of disposing of residual products, and the prices at which they were carried had been reduced to the present market rates. That difficulty was common to this country as well as to France.

The item "Renewals and Contingencies Fund, £57,057 7s. 6d.," appeared for the first time on the balance-sheet in the place of the former Insurance and Guarantee Fund. For some time past the Board had been impressed by the effect which would be produced upon the Company's financial position by any serious accident or disaster involving either the works or the district, and they felt that the Company was not really justified in relying upon its own funds to bear this risk. After considerable negotiations they were able to effect insurances covering the more serious risks involved, and for a premium less than the sum set aside annually hitherto for this purpose, and the Company was covered against any claims on this account, excluding, of course, those of a minor and more or less insignificant character.

The Insurance and Guarantee Fund was thereby set free, and the Board considered that the present would be a suitable opportunity to make provision for a class of expense which had hitherto been borne by the revenues of any year, and had on occasion caused serious disturbance in the profits.

It became necessary from time to time to undertake important works of renewal and replacement, which were distinct in character from the ordinary upkeep and repair of plant and apparatus. For instance, after the lapse of twenty-five or thirty years, or maybe a longer period, it might be necessary to re-sheet a gasholder—*i.e.*, to renew entirely, not the framing, but the bell which formed the container for the gas. Hitherto this expense had been borne by the revenues of the year in which the work had been carried out. As a fact, however, the sheets of the holders had been wearing out gradually year by year, and the cost of re-sheeting should properly be borne by a reserve created during the period in which the deterioration was taking place. The Directors had, therefore, decided to create a fund to bear the cost of work of this nature; the nucleus would consist of the balance previously standing to the credit of Insurance and Guarantee, to which would be added each year a fixed charge based upon the production of gas.

This change did not, of course, represent any additional charge against the station profits, because hitherto such renewals had been charged against the year's revenue and had been included with the ordinary wear and tear charges, whereas in future they would be charged against the Renewals and Contingencies Fund. On the whole of the stations together it should make very little difference to the profits, and in course of time the fund should be a valuable stabilizing or balancing influence on the year's results.

With regard to the Redemption Fund, the Chairman said that the bulk of this was invested in the business for capital or extension purposes. Provision must be made for the amortization in due course of the money so invested prior to the termination of the last concession. He added that, on the expiry of the various concessions, the mains became the property of the municipalities without payment, in every case, but the conditions applying to the works were all different. In some cases the works had to be taken over, sometimes according to a valuation, and sometimes by agreement.

The dates of expiry varied from 1936 onwards up to 1978, and two of the Company's most important concessions ran until 1970 and 1978 respectively.

As regards its business, the Company had found the general conditions very faithfully reflected therein, as might be expected. In 1929 there was an increase in the consumption of gas of 3·37 p.ct., and there were good markets for coke and tar. In 1930 the gas consumption had still shown an increase, although at a slower rate, but the residual products market was considerably weaker towards the end of the year, so that stocks had accumulated, and they were more difficult to dispose of.

All things considered, it was satisfactory not only to have maintained the 1929 consumption of gas, which was a record in the history of the Company, but to have added to it in 1930 by a little over 1 p.ct. Still more satisfactory, he considered, was the fact that there had been a steady increase in the number of consumers. It was common experience, however, that as time went on the cost of securing new consumers and new business generally was proportionately heavier than in pre-war times, owing to the increased cost of materials and labour.

A great deal of work had been done during the year in connection with the re-instatement of the Company's systems of mains; a systematic examination of the various networks had been carried out, and many repairs and replacements had been effected. The ground lost in the spring of 1929, in consequence of the abnormal frosts then experienced, which had got deeply into the ground and had disturbed the mains in several of the areas supplied with gas, had been, as far as the figures showed, made good, and there was a slight, but only a very slight, improvement in the 1930 figures as compared with those for 1929. Several years of steady work and heavy expenditure would be necessary before the mains at all the stations were in a condition which the Board could regard as completely satisfactory. The real test of the conditions was the percentage of unaccounted-for gas—the difference between the quantity of gas made at the various works and the amount paid for by the consumers, whether they were public or private.

One feature in connection with the business which should augur well for the future was the growth in the volume of trade done at the Company's showrooms; last year the turnover at every station was higher than before, and this, taken in conjunction with an increase in the number of fittings on hire, should lead to a greater consumption of gas. In this connection, however, he pointed out that modern apparatus was much more economical in the consumption of gas than the older type, and, in so far as apparatus sold replaced old material, the only advantage to the Company—although, of course, a very definite one—lay in the greater satisfaction of the consumers and the greater popularity of gas. Unfortunately, it was difficult to convince consumers that it was to the Company's interest that they should use modern economical apparatus rather than that the Company should sell larger quantities of gas through indifferent appliances. After all, the satisfaction of the consumers was one of the greatest assets the Company had in its business, and there was no doubt that the Company was making progress at all its stations in the development of a commercial service. He had stated on more than one occasion that it was necessary to ensure not only efficiency at the works, but, what was of even greater importance from the point of view of business, efficiency in the districts in the selling of something which the public wanted. The Company had organized part of the staff to constitute a

commercial service, especially entrusted with the development of harmonious relations between the Company and its consumers. It was hoped, by these means, to bring home gradually to the users of gas the fact that the Company was anxious and willing to assist them in utilizing the supply in the most convenient and efficient manner, and that it had not, as its sole object, the sale of the largest quantity possible.

Beyond the ordinary work of upkeep and maintenance, there was not much to record with regard to changes at the works; efforts had been concentrated principally on the systems of mains. New settings were being installed at Caen to meet the increasing demand for gas, and at the same works, in order to comply with Government requirements, there was being installed a small benzole-recovery plant, on the activated carbon system, for the purpose of absorbing benzole from the gas. The material used for this purpose was one which was found to be very effective during the war for application to gas masks for absorbing poisonous and injurious gases. Progress had been made also with the preparation of plans in connection with the new works at Roche Maurice, which were to take the place of those centrally situated in the city of Nantes. It was intended to make further progress during the spring.

The Chairman then dealt with the item of profit, which was less in 1930 than in 1929. Although the gross revenue had been greater, expenditure had been heavier all round, and the three principal items which had contributed to this latter increase were, first, the cost of upkeep of the plant and apparatus, which in 1930 had included a good deal of renewal and reconstruction work, properly chargeable to a reserve fund, the provision of which he had already referred to; secondly, the cost of replacement of mains, which was a necessary expense, the reduction of which would only be a false economy in the long run; and, thirdly, taxation. With regard to this last matter, he said that a reserve was made in the 1929 accounts for English income-tax at the rate of 4s. in the £1; but by last year's Budget the rate was increased to 4s. 6d., so that the 1930 profits had had to bear the 6d. not provided for in respect of 1929, and an extra 6d. for 1930—1s. in all. The extra 6d. represented approximately ¼ p.ct. dividend. The Directors did not feel justified in maintaining the previous rate of dividend of 5½ p.ct., free of tax, in face of this increased charge and the prospect of as high a rate in 1931. Accordingly, they proposed a final dividend of 3¼ p.ct., as compared with 3½ p.ct. a year ago, making 5¼ p.ct. for the year, as against 5½ p.ct.

Discussing the conditions of trade and industry in France during the past year, he said that on the whole they had been prosperous, but there had been indications during the latter part of the year of a slackening in the general prosperity which that country had of late enjoyed almost alone. A recent Ministerial declaration had contained the warning that France must be prepared to take its share in the world economic depression, and the trade returns indicated a diminution in the value of both imports and exports. But the falling-off of the total volume of trade and the foreign demand for French products was no doubt largely due to reduced purchasing power abroad, resulting from the world trade depression, rather than to weakness in France's own home markets.

There had been a certain amount of financial disturbance during the year, owing to the failure of a number of small French banks, but the establishments concerned had, generally speaking, been of quite minor importance; the Company had been affected in only one case, and that to a very small extent, and the Board had no reason to believe that there would be any loss incurred by the Company in this connection.

In spite of everything, however, it could not be said that conditions were bad in France; the crest of the wave of prosperity had, no doubt, been reached and passed, but it would be an exaggeration to use the word "depression" in connection with the state of her industry and commerce. While wholesale prices had shown a tendency to fall throughout the year, the retail price index had risen steadily, and wages, naturally, had tended to rise in sympathy.

Reference had been made on previous occasions to the small number of unemployed in France. The figure had shown substantial increases recently, and it had also become clear that previous figures were somewhat misleading, in that published statistics referred only to registered unemployed in receipt of relief. These had risen from a few hundred to over 40,000; but there would appear to be, in addition, at a moderate estimate, between 400,000 and 500,000 wholly unemployed, and about 1,500,000 partly unemployed, who did not figure in the registers. It must not be forgotten, however, that for some years France had been steadily importing foreign labour, and the effect of slackening trade on the labour market might be tempered to a great extent by the discharge of foreign workpeople; already the weekly departures were considerably in excess of the arrivals.

The Chairman also made reference to the French Social Insurance Law, which was referred to a year ago, and which is now in operation. The detailed regulations as to the manner of its application to the Gas Industry, he said, were still lacking, and so far as that Industry was concerned, the position was therefore, practically unchanged in this respect.

The prospects for 1931 were far from clear, and there did not appear adequate cause to anticipate any material improvement on the 1930 conditions. For the reasons already indicated, there would appear to be a possibility of a rather less prosperous period in France, and the Gas Industry was likely to follow the curve representing general trade conditions. On the other hand, the trade decline, up to the present, was relatively unimportant, and French policy in this respect was very cautious and conservative. So far as one was able to prophesy, or was justified in doing so, the prospects of 1931, without being brilliant, did not appear to be discouraging.

The Chairman then formally moved that the Report of the Directors and the Statement of Accounts for the year ended Dec. 31, 1930, be received and adopted.

Mr. FRANK H. JONES, M.Inst.C.E. (Deputy-Chairman), seconded.

There was no response to the Chairman's invitation to the stockholders to discuss the Report and Accounts, which were adopted.

The CHAIRMAN moved that the interim dividend of 2 p.ct., paid in October last, be confirmed, and that a final dividend for the year ended Dec. 31, 1930, at 3¼ p.ct. be declared, to be paid on April 1, 1931, the whole out of interest and profits, and free of income-tax.

Mr. FRANK H. JONES seconded.

The resolution was carried.

Mr. FRANK H. JONES proposed the re-election of Dr. Charles Carpenter and Mr. C. P. Crookenden—the Directors who retire by rotation—to the Board, and added that it was a privilege and a pleasure to do so. He did not attempt to justify by words the re-election of these two gentlemen (for the reason that it was unnecessary to do so), except to point out that Dr. Carpenter had reached a position at the very top of the Gas Industry, and that the stockholders would be well advised to re-elect him, and also Mr. Crookenden.

Mr. W. G. BRADSHAW, C.B.E., seconded.

The resolution was carried.

The CHAIRMAN expressed his thanks to the stockholders for their expression of their continued confidence in him. He admitted a certain degree of disappointment in the results attained, particularly in regard to leakage or unaccounted-for gas, in respect of which he had hoped that some more definite progress would have been made in the past year. When he considered the large amount of money which had been spent by the Company on the replacement of mains he hoped that by this time more definite results would have been achieved in regard to leakage, but it looked as though they were merely keeping pace with the leakage, and that some time would elapse before more definite results would be achieved. It was particularly disappointing to him because, if there was one matter in connection with which he would regard himself as being somewhat expert, it was the mains systems of large cities. Pope had said, "Man never is, but always to be blest;" in regard to this problem of mains, he (the Chairman) was always hoping to be blessed, but year by year that blessing was postponed. However, he assured the stockholders that he would do his best in the future as he had done in the past.

Mr. CROOKENDEN also returned thanks, and said that the honour of being a Director of the Company was one which he appreciated highly. He was interested very largely in the Gas Industry, and so long as he was able to serve the Company he would continue to do his best.

On the motion of Mr. A. TOZER, seconded by Mr. E. F. DONNE, the Auditors of the Company—Mr. G. C. Goldsmid and Mr. B. Dennett Holroyd, F.C.A.—were re-elected for the ensuing year, at the same remuneration as in the previous year.

Mr. B. DENNETT HOLROYD returned thanks on behalf of Mr. Goldsmid and himself.

The CHAIRMAN moved that the best thanks of the meeting be accorded the Company's staff in London and abroad for their services during the past year. Whatever troubles the Company might encounter, he said, it could congratulate itself upon having a most admirable staff. In a tribute to Mr. F. Eliot Williams (the General Manager and Secretary, in London), he said that his qualities for the post he held were unique; if the Company had not the benefit of his services one did not know where it would find another man with precisely his qualities, those qualities being precisely what the Company required. The staff abroad was not only an admirable, but an uncommon, one. It must be remembered that the members of the staff abroad had very considerable powers. The Company had to rely upon them in everything that was done—for the diplomatic work on the spot, so to speak, and for the proper maintenance of the conditions in the works and in the districts. The more he saw of these gentlemen, the more was he impressed by the wisdom of the choice which had placed them in the positions they occupied.

Mr. FRANK H. JONES seconded, and heartily endorsed the Chairman's remarks, which, he added, applied to every member of the staff.

The vote of thanks was carried unanimously.

Mr. F. ELIOT WILLIAMS, O.B.E. (General Manager and Secretary), in his response, said that the staff in London could not carry on their work if the staff abroad were not fully conscious of their responsibilities and were not doing their best to carry them out. For himself, he said that when he had first occupied the post of General Manager and Secretary he had stated that, if he could follow worthily in the steps of his father, he would feel that he had done well; the Chairman's remarks had encouraged him to believe that he had been able to achieve some measure of success.

Mr. D. H. MCLAUCHLAN proposed a vote of thanks to the Chairman and Directors for the manner in which they had managed the Company's affairs. He assured them that they had done very well, and that the whole of the stockholders were very much obliged to them.

The vote was seconded by Mr. A. TOZER, and was carried unanimously.

The CHAIRMAN, responding, said that the conditions had been difficult, and, as he had already indicated, the Directors had not the full measure of satisfaction that they would have liked. They were all great believers in the future of the Company, however, and he felt quite certain that it was only a question of time for their belief to be justified.

The meeting then closed.

Sheffield Gas Company.

Lieut.-Col. H. K. STEPHENSON, D.S.O., presided at the Annual Meeting of the Sheffield Gas Company, held at the Offices of the Company on March 9.

Moving the adoption of the report and accounts, the CHAIRMAN said: There is an overspent balance on capital account of £12,477, but in view of our financial position this is of no importance. Turning to the revenue account, after making full provision for all expenses, the surplus on the year's working amounts to £163,603, as compared with £157,409 for the year 1929. There are decreases in revenue from the sale not only of residuals but also of gas. The decrease in the case of the former is due chiefly to the smaller quantity of gas made, though prices have also been worse. The decrease in revenue from the sale of gas is due in part to the reduction in quantity sold owing to acute industrial depression, but still more to the lower average price of this our principal commodity.

Our policy has always been to help Sheffield trade to the fullest possible extent by selling our gas for industrial purposes at the lowest possible price, and we are now feeling the full effects of the successive reductions in price made during recent years. It is entirely due to this policy that our sales of gas show so small a diminution as 2·89 p.ct., which, having regard to the increase of 2·81 p.ct. a year ago, does little more than put us on an equality with 1928 when trade was infinitely better than it is to-day. We are, however, able to offset these reductions in revenue by large decreases in expenditure, with the result that we are able to show a surplus. The average price at which our gas was sold during the past year would have justified the payment of a higher rate of dividend than that proposed, but after full consideration your Board decided to recommend the same dividend as last year, which involved a reduction in our "carry forward" of £7182.

In spite of the fact that trade depression has affected the output of houses built by private enterprise a total of 15½ miles of new or replacement mains has been laid. We have extended our mains to practically all the new roads as they have been constructed and carried services into the houses as they have been built. Altogether 2213 services have been laid during the year. Further improvements have taken place in the lighting of our city, a larger number of mantles per lamp having in many cases been installed with great advantage. During the year, 506 additional gas lamps have been erected.

On the motion of the CHAIRMAN, seconded by Mr. B. G. WOOD, the report was adopted.

The CHAIRMAN also moved a dividend of £3 5s. p.ct. for the half-year on the consolidated stock.

This was seconded by Mr. BLAKE, and carried.

Brighton and Hove General Gas Company.

The Annual General Meeting of the Brighton and Hove General Gas Company was held at the Offices of the Company, 5, Great Winchester Street, Old Broad Street, E.C. Mr. A. M. PADDON, M.Inst.C.E., the Chairman of the Company, presided.

The CHAIRMAN, having dealt with the matters referred to in the Directors' report, stated that the net results of the year's trading was that the profit had increased by over £6000. Turning to the profit and loss account, he said they had carried from the undivided profits a sum of £34,984, and credited to the contributory pensions fund. It would be seen that they emerged as the result of the year's operations with a surplus of nearly £3000 over their normal requirements. The reserve fund showed that it was of ample dimensions, and was nearly all invested outside the Company. The special purposes fund showed that a sum of £44,000 was also invested outside the Company, and the renewal fund was really a floating credit, simply absorbing abnormalities and inequalities year by year in the maintenance of works.

Coming to the balance-sheet, the Chairman said: You will see that while the investments I have reported to you stand at a book value of £142,000, their actual valuation at the end of the period of accounts was £166,000, and that, in itself, I know will be gratifying to you. We have over £66,000 invested, standing to the credit of the co-partners, the bulk of which is invested in the capital stock of the Company. This co-partnership has now lasted for nearly eleven years, and each year has made us more definitely conversant with the great advantages which accrue from any such scheme.

The Chairman then went on to deal with the great advantage of co-partnership in industry and its effect upon industrial relations. Continuing, Mr. Paddon went on to protest against Government support of electricity, referring also to freedom of choice for municipal tenants, and, citing the recent decision of the L.C.C. in this respect, he said: I sincerely hope the action of the London County Council will have its effect, and that the Gas Industry will have better treatment in the future from the municipalities throughout the country than in the past. If the electrical industry is to take over from the Gas Industry, as is openly suggested, the duty of supplying heat to the public which is now supplied by the Gas Industry, then for every ton of coal used by the Gas Industry the electrical people must use eight or nine tons of coal to render an equivalent of heat. Given a ton of coal, in a power station of the latest type, the heat given back to the public through electricity is 12 p.ct. Take a ton of coal into the gas-works, and by gas alone nearly 50 p.ct. of the heat of that coal is returned for use to the public, and if you add in the residuals and the corollary of coke, then 85 p.ct. of that coal is re-issued in the form of heat, and only some 15 p.ct. is lost, whereas, in the case of an electrical undertaking aspiring to supply heat, 75 to 80 p.ct. of the thermal efficiency of that coal is lost. Such a ludicrous travesty of economy employed cannot be ignored, and all the Government partisanship in the world and the special advocacy of Ministers cannot disturb those natural facts.

Mr. G. W. CAREY (Deputy-Chairman) seconded the resolution, and it was unanimously adopted.

The dividends recommended in the report were declared, and a resolution relating to the amendment of the contributory pensions scheme was passed, and a resolution to raise further money by borrowing was agreed to.

The retiring Directors and Auditors were re-elected, and the proceedings terminated with a cordial vote of thanks to the Chairman, Directors, management, staff, and employees.

Leatherhead Gas and Lighting Company.

Dr. LAURENCE POTTS presided at the Annual Meeting of the Leatherhead Gas and Lighting Company, held at the Gas Offices, North Street, Leatherhead.

Moving the adoption of the report, the CHAIRMAN said, although they received no special assistance from the weather last year, there was an increased sale of gas. The first quarter, which had to be compared with a very cold period, showed a decrease of 7½ p.ct. Then things rapidly improved, June giving an increase of 2½ p.ct., September, 7½ p.ct., and December, 11½ p.ct. Adjusting those rates, they got an average net increase for the whole year of 3 p.ct. During the year they had had added 223 new customers, bringing the total to 5055. Over 5000 yards of new main had been laid, making the total length about 81 miles.

Dealing with the accounts, he said it would be observed that the principal item under capital expenditure had been the setting up of additional vertical retorts costing £14,284. Against this, however, £3980 had been written off and charged to the revenue suspense account in respect of the last lot of old horizontal retorts. The whole of the coal was now carbonized by verticals, resulting in an increased yield of gas per ton of coal, greater uniformity in quality, and freedom from naphthalene. The Company's 5½ p.ct. debenture stock had been in good demand, and during the year £12,135 had been placed at par free of expense, the buyers including a good number of local people. The revenue account showed additional receipts from gas of £563, but residuals were £440 lower. On the debit side, coal and oil was £1048 less, and maintenance of works, due to the absence of the extensive replacements which fell to last year's accounts, was £2210 lower. Distribution expenses showed a saving of £925, and all these savings had enabled an additional sum of £4206 to be credited to profit and loss account.

After making the necessary adjustments in the profit and loss account, the net improvement for the year was £4481, but this was without dealing with the revenue suspense account. This account started the year with a debit of £4846, to which had been added the £3980 in respect of the old retorts, making a total of £8826. The Board had reduced this total by transferring £3826 from the profit and loss account, leaving a debit balance of £5000. It was believed that the shareholders would agree that it was good work to write off in one year so large a sum as £3826. The amount carried forward, after allowing for dividends, would be increased from £455 to £1268.

The motion was seconded by Sir ARTHUR DUCKHAM, who said the shareholders must feel satisfied with the progress which had been made.

North Middlesex Gas Company.

The Annual General Meeting of the proprietors of the North Middlesex Gas Company was held at the Offices of the Company, 5, Great Winchester Street, Old Broad Street, E.C. 2, on March 2, 1931—Mr. A. M. PADDON, M.Inst.C.E., Chairman of the Board, presiding.

The SECRETARY (Mr. Hyde C. Burton) read the notice convening the meeting. The report stated: The sale of gas for the year shows an increase of 1·86 p.ct., compared with that for the preceding year. The profit for the year (including interest received) after charging interest on debenture stock and temporary loans, income-tax, &c., and appropriating the sum of £2000 for superannuation, amounts to £22,456, which with £5925 brought from the previous year makes the disposable balance £28,382. Interim dividends on account of the year ended Dec. 31, 1930, declared by the Directors, were paid on Sept. 3 last at the following rates—viz., on the 5 p.ct. preference stock, 5 p.ct. per annum; on the 6 p.ct. preference stock, 6 p.ct. per annum; and on the standard consolidated stock, 7½ p.ct. per annum (less income-tax), and the Directors now recommend the declaration of final dividends for the year ended Dec. 31, 1930, at the same rates (less income-tax), and that £2327 be transferred to the reserve fund. These appropriations (including the interim dividends) amount to £21,810, leaving £6571 to be carried forward to the credit of the profit and loss account for the current year.

The CHAIRMAN, in moving the adoption of the report and accounts, said that, considering the statement they had to present that day related to a period of some difficulty, he thought it would be found satisfactory in its details. They had sold 14 million more c.ft. of gas, equal to 1·86 p.ct. It must be remembered that a year ago the increase represented 8·76 p.ct., and to superimpose upon that record a further increase, however small it might be, was an accomplishment with which

they might be well satisfied. Dealing with the statements relating to capital, the Chairman said they had unexpended power of nearly £65,000 capital stock. There also remained to be borrowed £52,000 debenture stock. The total receipts on capital account amounted to £493,000, this being equivalent to a user of £643 per million c.ft. of gas sold.

Turning to the revenue account, the Chairman said the total rental received during the year was about £1880 more than a year ago. It was not a large amount, but he would remind them that the price of gas had been at the rate of 9·4d. per therm, whereas for a considerable portion of the preceding year the price was 9·8d. For the whole year the difference between 9·8d. and 9·4d. was well over £6000. They had the satisfaction, therefore, of knowing that while they had reduced the price of gas the gross sum received had been increased. Residual products had brought in nearly £5000 more. With this increase in residuals, the total receipts were nearly £7000 more.

Going to the other side of the account, there were certain economies and also increases in expenditure to note. Coal, oil, and coke had cost slightly less; on repair, maintenance, and renewal of works and plant the expenditure was £2500 less; on repair and maintenance of stoves and fittings the expenditure was £1094 more. These figures might make an ordinary critic apprehensive as to whether all legitimate charges for maintenance had been met, but the fact that the total came to nearly 15d. per 1000 c.ft. should be enough to reassure anybody in this connection. For pensions and superannuation they had allotted £2734, the special purposes fund benefited to the extent of £2000 (£500 less than last year, but a very handsome addition), and the renewal fund received £3000.

Dealing with the profit and loss account, the Chairman said after the requirements of dividend and various other purposes had been met they carried forward £6571, an increase of over £600. The reserve fund stood at the handsome figure of £31,600, which was nearly all invested, and this afforded security to proprietors in respect of their dividends. To show how closely the distribution of gas was carried out, he might add that the unaccounted-for gas during the year amounted to only 2·64 p.ct.

It was then resolved, on the motion of the CHAIRMAN, seconded by Mr. H. A. LERMITTE, that the report of the Directors and the accounts of the Company for the year ended Dec. 31, 1930, be adopted, and on the motion of the CHAIRMAN, seconded by Mr. G. W. CAREY, it was further resolved to declare final dividends for the year as recommended in the report.

Southgate and District Gas Company.

The Annual General Meeting of the proprietors of the Southgate and District Gas Company was held at the Offices of the Company, 5, Great Winchester Street, Old Broad Street, E.C. 2—Mr. A. M. PADDON, M.Inst.C.E., Chairman of the Board, presiding.

The CHAIRMAN, in moving the adoption of the report and accounts, said: All that had to be now reported was of a satisfactory character. They had had an increase in the sale of gas, which amounted to 0·43 p.ct. That at least indicated they were on the right side, and proprietors would be interested to know that since the beginning of the current year the progress had been much more marked and regular. Turning to the accounts, the Chairman said that the capital receipts stood at £262,411, and, disregarding the amount added on conversion, the capital invested amounted to £563 per million c.ft. They would like to see it lower, but it had generally stood at a higher standard. They expected to be able to improve this figure during the current period. The expenditure on capital account during the year was £13,816, from which must be deducted £4289 in respect of obsolete works and depreciation. On the revenue account they had received by the sale of gas £3300 less, but the diminution in receipts was the direct consequence of a reduction in price from 10·8d. to 9·9d. per therm. The rental of meters, stoves, and fittings, which was always a useful figure to consider as it recorded the activity of the undertaking, had increased by over £759. The total rental was £2542 less. Residual products had brought in £1650 more, and the issue of the whole matter was that the total receipts were £915 less than a year ago. This was amply accounted for by the reduction in the price of gas. The outcome was that their expenditure had increased by £1016, and their receipts had decreased by £915, and the total profit had decreased by £1931.

By the general balance-sheet it would be seen that they had investments of a book value of £34,370, but the valuation at the end of the year was £37,339. Having regard to their undertaking, this was, he thought, a satisfactory state of things. The total amount standing to the credit of co-partners after a period of only seven years was £9324, and each co-partner who had left his interest undisturbed would have from £70 to £80 to his credit.

It was then resolved, on the motion of the CHAIRMAN, seconded by Mr. G. W. CAREY, Deputy-Chairman, that the report of the Directors and the accounts of the Company for the year ended Dec. 31, 1930, be received and adopted, and that the report be entered on the minutes. It was further resolved, on the motion of the CHAIRMAN, seconded by Sir CHARLES L. MORGAN, that there be declared dividends for the half-year ended Dec. 31, 1930 (being final dividends for the year), as follows: On the preference capital, 5 p.ct. per annum; and on the consolidated (7 p.ct. maximum) capital, 7 p.ct. per annum (both *less* income-tax).

Uxbridge, Maidenhead, Wycombe, and District Gas Company.

A year of steady and consistent progress was reported at the 70th General Meeting of the Uxbridge, Maidenhead, Wycombe, and District Gas Company, held at Westminster Palace Chambers on March 5—Alderman H. S. BUTTON (Chairman of the Board) presiding.

In moving the adoption of the report and accounts, Alderman BUTTON said there had been an addition of 15 miles to the mains, bringing the total to 333 miles. The area covered by the Company's supply was 234 square miles. During the year 2278 new meters and 926 new cookers on slot meters had been fixed, and 2774 cookers and fires had been sold. The revenue account showed an increase of 2·86 p.ct.; gas sold amounted to 871 million c.ft., an increase of 3·03 p.ct., so that the business had increased faster than the capital. They regarded the increase as satisfactory, because it followed a phenomenal increase of 9·2 p.ct. for 1929. Alderman Button then referred to the increasing amount the Company were paying in rates. The accounts show a profit for the year of £38,940, which, added to the balance of £6047, brought forward from last year, gives a total of £44,987. Deducting therefrom £10,352 for interest, &c., this leaves a balance of £34,635 available for dividends. The Directors recommend the payment of dividends (*less* income-tax) of 5 p.ct. per annum on the 5 p.ct. preference stock, 5½ p.ct. per annum on the 5½ p.ct. preference stock, and 7 p.ct. per annum on the ordinary stock, which will absorb £26,990, leaving a balance of £7645 to carry forward to next year's account.

Alderman J. W. WALKER seconded the report and accounts, which were adopted, and the recommended dividends were then declared.

Southend Gas Company.

What was probably the last Annual Meeting of the Southend and District Gas Company was held at the Offices of the Company, York Road, Southend, and was followed by an Extraordinary Meeting to consider the provisions of the Bill before Parliament concerning the amalgamation with the Gas Light and Coke Company. The CHAIRMAN OF DIRECTORS (Mr. J. H. Burrows, J.P., C.A.) presided, and, at the conclusion of the business, took the opportunity of paying a glowing tribute to the loyal services rendered by the officials of the Company.

The annual report of the Directors stated that during the last year there was a sale of 1,116,600,000 c.ft. of gas, an increase for the year of 16,086,000 c.ft.

The CHAIRMAN, moving the adoption of the report and accounts, said: For the Board of Directors, I submit for consideration and adoption our report and statement of accounts for last year, and at once announce it to have been a most successful period. Before touching on various aspects, I note that, should the Gas Light and Coke Company's Bill in Parliament become law, this will be our last annual meeting of proprietors. The Company was founded in or about the year 1854, and was an effort made by men who desired to serve the very small Southend of that far-off year. They believed that Southend had a future, as so many successors have held, and still hold, and the formation of this Company was one of their efforts. For years there was plentiful self-sacrificing work put in by them, with little return. In due season the venture was turned into a statutory undertaking, and, in common with all gas companies, it has suffered the disabilities which were thought quite proper in a Victorian period when the undertaking managed was a monopoly, but they are irksome, inconvenient, and disadvantageous now there is no real monopoly. A gas undertaking has to prosper by means of the effective service it supplies. At all times in its history the Company has provided for the locality a reasonable service, and my assertion in regard to the period since the war is that our abundant service has largely contributed to the growth and prosperity of the County Borough and district, in addition to providing each year by rates and dues much of the money spent by local governing bodies. Until a few weeks back the undertaking has employed an ever-increasing number of men, and that setback was limited and only lasted a few weeks. Perhaps not at first, but shortly, the Gas Light and Coke Company, with its enormous resources and highly developed management, ought to, and will, serve our town and district better than we have done.

The year 1929 brought about a big consumption of gas owing to the terrible cold of February, but our record for this year shows a still bigger sale by 16 millions of cubic feet—that is to say, from over 1100 millions to over 1116 millions, and you will learn with pleasure that so far this year the output has grown quite satisfactorily—even remarkably, looking to all conditions associated with this period. A summary of our experience during last year can read as a steady year of progress, showing growing appreciation of, and dependence on, gas in every section of our district. Naturally the coming change has affected us, and stockholders will not be surprised that we have kept down our new capital expenditure to about £7000.

Mr. ALFRED TALBOT (Deputy-Chairman) seconded, and the motion was carried unanimously.

The CHAIRMAN then proposed that the dividends, as recommended by the Board, be declared payable: On 5½ p.ct. and 6 p.ct. preference at the rate of 5½ p.ct. and 6 p.ct. per annum; £7 5s. p.ct. per annum on the original consolidated and new ordinary stocks, and £6 17s. 6d. p.ct. per annum on

the new ordinary " B " stock, all *less* income-tax. These dividends, he remarked, were the full statutory dividends.

Dr. WALKER seconded, and the motion was carried unanimously.

The Extraordinary Meeting followed for the purpose of considering the provisions of the Bill now before Parliament providing for the transfer to the Gas Light and Coke Company of the undertakings of the Southend Company and the Brentwood Gas Company, to confer various powers upon the Gas Light and Coke Company, and for other purposes.

East Surrey Gas Company.

The Annual Meeting of the East Surrey Gas Company was held at the Club Room, Gas-Works, Brighton Road, Redhill—Mr. W. LEES STENNING, J.P. (Chairman), presiding.

Reviewing the year's activities, the CHAIRMAN said: The sale of gas showed an increase of 1·55 p.ct. They had added 440 consumers, bring the total up to 14,783; and the sales of new appliances had been most satisfactory, their showrooms throughout the district fully justifying themselves. The net result was that, after providing for the dividends on the preference stocks, they were able to recommend the usual dividend of 5½ p.ct. on their ordinary " B " stock, and to carry forward the sum of £4383 to next year's account. Their co-partnership scheme expanded steadily with the growth of their business, and the consequent additions to their pay roll, and imparted a sense of proprietorship and goodwill among all grades of their employees.

Mr. W. H. BENNETT seconded the resolution for the adoption of the report and accounts, which was carried.

Mr. HUNT, returning thanks for his re-election as a Director, said it was a great pleasure to take an active part in this progressive undertaking. Since he was first elected on the Board, some 39 years had passed. In those early days their sale of gas was at the rate of 55 million c.ft. per annum, and the number of consumers was well under 1000. Now, their output was at the rate of 480 million c.ft. per annum, and the number of consumers was nearly 15,000. In the past three years alone the output of gas had increased by 109 million c.ft., an advance of more than 29 p.ct.

Tunbridge Wells Gas Company.

The Annual General Meeting of the Tunbridge Wells Gas Company was held at the Offices, 44, High Street, when the CHAIRMAN OF DIRECTORS, Mr. Harold A. Beeching, presided.

The CHAIRMAN, in moving the adoption of the report and accounts, said: At a time of national depression such as we are going through at the present time—and you know it is pretty severe, and nearly everybody is affected one way or another—your Directors are glad to be able to present a satisfactory account of the past year, and to report that the Gas Industry is holding its own, and our Company's business is sound and progressive. Manufacturing costs appear to be £2300 less, but last year we transferred £2500 to renewals account, so there is little change, although coal has actually cost more. We have not been obliged yet to raid the renewals fund, which remains at £12,500. Distribution expenses are some £2000 lower, less having been spent on repairs and maintenance of mains and plant. Rates and taxes have increased by £300, and management costs are £400 up. The item of £330 is the balance of costs for our Special Order of 1929. The co-partnership and pension funds tend to show small increases, as we have now included a number of the Crowborough employees. The pension fund now stands at £15,325, of which over £8000 is invested in gilt-edged securities, and the balance is on deposit with the Company. The fund has been investigated by an actuary during the year, and found to be in a thoroughly sound condition. The number of co-partners is 180, of whom 140 hold stock in the Company to the value of about £6000. The co-partnership spirit among our staff and employees has steadily grown, and I believe this spirit has largely contributed to the continued success of the Company.

Rental of meters, cookers, and heating stoves shows a steady increase, which means expansion in the Company's business and in the number of consumers, now 14,385. New gas stoves sold and hired during 1930 show a satisfactory improvement. I am glad to say that residuals show an increase of about £1750, due to coke sales, which show £2800 more, but tar is £450 less, though we hope for better results this year. We have carried £1250 from profit and loss account to reserve fund, against £2500 last year, and, after paying the same dividend, carry forward £26,750.

Hastings and St. Leonards Gas Company.

Although the consumption of gas had slightly decreased, the Hastings and St. Leonards Gas Company were again able to report a satisfactory year of progress.

Mr. A. M. APEL, presiding, said: Although the amount spent on new buildings, manufacturing plant, &c., shows a decrease of about £4000, we have expended £5209 on new mains and service pipes (an increase of £1611 over the previous year). New meters show an increase of £394, and new stoves, at £1888, show a decrease of about £250 as compared with 1929. After deducting £5000 for depreciation on meters, stoves, works, and plant, and writing off £2500 of the old works and plant account, there remains an increase in the capital account of £3564. Our actual sales of gas are almost identical with the abnormal year of 1929, when practically every gas company in the kingdom broke all previous records, principally due to the severe weather experienced in the first three months of that year. The cost of coal, oil, and coke, at £57,498, is £1350 in excess of the previous year. The next item to be noted is repair and maintenance of works and plant, &c., which shows an increase of about £4000 over 1929. This is accounted for by the expenditure of £3960 in reconstructing the showrooms and offices, and for repairs to No. 4 holder. The repair, maintenance, and renewal of mains is about £1800 less than last year.

Turning to the credit side, the amount received by the sale of gas is £114,341; this is £4000 less than last year. This decrease is entirely due to the fact that the price of 10d. per therm compares with 10½d. per therm charged during the greater period of 1929, the price being reduced ½d. per therm on Oct. 1 of that year. So that this amount of £4000 has been an actual gain to the consumer by the lower price they have paid for gas. Of the gas made, 95·5 p.ct. was actually paid for; 1·22 p.ct. was used on works; " unaccounted-for," 3·28 p.ct.—by comparison a very favourable figure. The make of coal gas per ton was 13,744 c.ft. Rentals for meters and stoves show an increase of £560, and in respect to this item I would mention that 889 new appliances have been sold during the year under review, entirely apart from those on hire purchase or hire, and 625 new customers added to our books. With regard to residual products, coke shows an improving market, the sales of which, at £16,620, show an increase of £1443 over 1929.

The result of the year's working leaves us with a balance of £27,166.

Isle of Thanet Gas Light and Coke Company.

Mr. WALTER HILLS, the Chairman of the Company, presided at the Annual General Meeting of the Isle of Thanet Gas Light and Coke Company held at the Company's Offices, The Dane, Margate.

The CHAIRMAN, addressing the meeting, said: After the meter readings in March last, the price of gas was reduced to 8d. per therm, and, consequently, the income from this source—including public lighting— shows a reduction of almost £7000.

We referred at our last annual meeting to the new plant then being erected, to meet the growing demand for graded coke, in lieu of the old coke-handling methods in use many years ago, but now discarded. This new plant was in operation during the whole of last winter, enabling the supply of coke suitably graded, to meet the needs of the modern domestic coke boiler, and the increase in the sale of this class of fuel has been remarkable. Last year we were contemplating the installation of a water gas plant, in the place of the old inclined retorts, and in this way hoped to be better able to regulate our coke market, as well as the quantity produced. This plant was erected, brought into operation early in July, and worked intermittently during the remainder of the year, with the satisfactory result indicated in the statement of accounts, showing that the quantity of coals used was less by nearly 5000 tons, and 4200 tons less of coke sold. During the period that this plant has been in operation, approximately 950 tons of coke and 75,000 gallons of oil have been used; the costs being included in the item " coal " on the expenditure side of the revenue account, this being about £3000 less than in the previous year, and the value of this plant is indicated in the accounts, clearly exemplifying the economic value of this process.

The profit and loss account discloses a carry-forward to next year of an amount approximately equal to that brought into it last year, and that the profit of the year under review is only £113 less than that earned in 1929.

Mr. WM. TOMLIN, J.P., seconded the proposition.

Oxford and District Gas Company.

Alderman F. W. ANSELL, J.P. (the Chairman), presided at the Annual General Meeting of the Oxford and District Gas Company.

Moving the adoption of the Directors' report, the CHAIRMAN said: Turning to the revenue account it will be noticed that expenditure on the manufacture of gas is increased by approximately £5000 and on the distribution of gas by approximately £700, and that the total expenditure has increased by approximately £10,000, or just over 5½ p.ct. On the other side of the account, we have sold 4·6 p.ct. more gas, and our revenue from gas, meter, and stove rents has increased by over £10,000, and receipt for residual products has increased by £4400, although we again show a drop in the receipts for tar and liquor. The net result of the year's working shows a profit of £46,357, or an increase in profit of £4652.

Mr. BRADLEY seconded the resolution, which was carried unanimously.

The CHAIRMAN then moved the payment of the full statutory dividend at the rate of 5 p.ct. per annum on the preference stock and at the rate of 10 p.ct. per annum on the ordinary stock for the half-year ended Dec. 31, 1930; also payment of the full statutory dividend of 6 p.ct. per annum from July 31, 1930, on the new redeemable preference stock.

Mr. W. E. CATON, the Engineer and General Manager, in acknowledging a vote of thanks to the staff and employees, said that during the year they had added the area of the Abingdon Company to the area of supply, and in so doing had added

1821 consumers to their list at date of transfer. In the whole of the area during 1930 they added a further 1179 new consumers, making the total increase in consumers of 3000 during the year, and bringing the total number of consumers at Dec. 31 last to 21,103. The number of additional cookers on hire and sold outright had increased by 1160, as compared with 1242 in 1929; the number of gas fires on hire and sold outright by 612, as compared with an increase in 1929 of 770; the number of radiators, geysers, and circulators by 210, as compared with 168 in 1929; the number of slot installations by 435, as compared with 569 in 1929; and the number of public lamps by 140, as compared with 104 in 1929. All these increases did not include the various appliances taken over and in use at Abingdon. In the new areas into which they had recently extended their mains they had exceeded their expectations. Although they only commenced laying mains in February, 1930, by Dec. 31 they had in one district nearly 50 p.ct. of the available houses connected up and in another about 35 p.ct., and orders were coming in daily from these new areas for a supply of gas. The quantity of gas accounted for last year exceeded that of 1929 by approximately 40 million c.ft., or 4·6 p.ct., as compared with an increase of 42¼ million in 1929. Although it took the Company 100 years to reach a sale of 388 millions per annum it had only taken twelve years to increase this sale by another 560 odd millions to over 900 millions per annum, or 150 p.ct. increase during this period.

Further Company Results in 1930

Burnham-on-Sea.

Reference to the possible amalgamation of the Burnham-on-Sea Gas Company with the Weston-super-Mare Gas Light Company was made at the Annual Meeting of the shareholders of the Burnham Gas Company, Ltd. Mr. J. Cox (Chairman of Directors), in his annual report, commented upon the steady progress of the Company, and the result of the year's working revealed a gross profit of £2892. The financial year, 1930, he said, ended with our Company in stronger position than ever before. It is only fair to add that this state of affairs is almost entirely due to our adoption three years ago of the Moore process, whereby the gas produced per ton of coal has risen from 15,473 c.ft. under the old system to 20,451 c.ft. under the Moore process in 1930, an increase of nearly 5000 c.ft. per ton of coal. Manufacturing costs at £7166 show an increase of £600 over last year. There is no less a sum than £1100 included in these costs for repairs to works, which are exceptional charges in so far as they do not recur annually. The total sales of gas amount to £10,423, as against £11,057 last year—a decrease of £634. Approximately half of this sum represents the decreased receipts from public lighting, while the remainder represents the decreased sale of gas during the mild early months of 1930, compared with the severe period of 1929. Residuals at £1025 show an increase of £322 over last year, although generally speaking, the residual market is still far from satisfactory. The result of the year's working is a gross profit of £2892, and the balance of profit and loss account shows £2600 to be carried forward, subject to the final dividends to Dec. 31.

Cheltenham.

The Directors of the Cheltenham Gas Light and Coke Company submit a report for the year ended Dec. 31, 1930, showing a profit of £22,039. The contingencies fund having reached the sum of £25,000, the Directors feel justified in re-opening the reserve fund by the allocation of £6000—4 p.ct. consolidated stock at cost. The quantity of gas sold to consumers in 1930 was 580,278,600 c.ft., which has exceeded the amount sold in 1929 by 1,841,100 c.ft. During the year an important extension to the purifying house has been completed, and an up-to-date coke grading plant installed. The Directors recommend the payment of a dividend at the rate of 5 p.ct. per annum on the paid-up consolidated ordinary stock for the year ended Dec. 31, 1930, out of the profits for that year.

Colchester.

Owing to mild weather in the early part of the year and the depression in trade, the sales of gas by the Colchester Gas Company showed a decrease of 3 p.ct. During the year the Company took part in the Empire Exhibition at the Castle Park and gave a good display, showing the various applications of gas. The new gasholder was completed during the year and officially brought into use on Dec. 17. The balance on the revenue account for the year amounts to £13,642. Interim dividends at the rate of 6 p.ct. per annum on the preference stock, £6 7s. 6d. p.ct. on the "A" shares, and £4 9s. 3d. p.ct. on "B" shares were paid on Sept. 1 last, and the Directors recommend the declaration of final dividends at the same rates.

Dover.

After paying the interim dividend in September last and interest on the loan capital, and contributing the sum of £977 to the renewal fund and the sum of £977 to the special purposes fund, the accounts of the Dover Gas Company show an available balance of £13,983. Out of this the Directors recommend a final dividend at the rate of 4¼ p.ct., less tax (making with the interim dividend 8½ p.ct. for the year).

Penistone.

The Directors of the Penistone and District Gas Company regret the change in the fortunes of Penistone and district, brought about by the complete closing of the steel works of Cammell Laird & Co., Ltd. These works were the mainstay of Penistone, which has felt with full force one of the adverse effects of rationalization. The chief support of the township being removed, there has been much unemployment in consequence, and this, together with the loss of the steel works, has substantially reduced the sale of gas, which was 111,890 therms in 1930, against 127,695 therms in 1929, a reduction of 16,215 therms, or 12·71 p.ct. The balance of profit has also been substantially reduced. Unless the works are re-opened or taken over by some other company, the Directors fear there may be a further reduction in the sale of gas during 1931. The profits for the year amount to £1142, which, with the balance brought forward from the previous year (£197), makes a total of £1340. Interest on debentures absorbs £186, and dividend on preference shares £352 (both tax deducted). An interim dividend on the ordinary shares was paid for the June half of the year at the rate of 10 p.ct. per annum, which, *less* tax, amounted to £387. From the balance available (£414), the Directors recommend that a dividend for the December half-year be paid at the rate of 6 p.ct. per annum, leaving £181 to be carried forward.

Rhymney.

The report of the Directors of the Rhymney and Aber Gas Company for the year ended Dec. 31, 1930, shows a profit on the year's working amounting to £15,486.

St. Austell.

At the 61st Annual Meeting of the St. Austell Gas Company, Ltd., on Feb. 23, Mr. S. J. Ingram, the Chairman, presided. The report of the Directors showed that gas sales had increased by 666,000 c.ft. for the year ended Dec. 31, 1930, and that there had been an increase of 27 consumers, which now totalled 1907. The balance sheet showed a profit of £2178, which the Directors recommended should be appropriated as follows: 8½ p.ct. dividend on old shares, 7 p.ct. on new shares, less income-tax; allocated to renewals fund, £150; to special purposes fund, £150; to reserve fund, £200; carried forward, £973. The Chairman said: The progress has not been spectacular—an increase of 666,000 c.ft. in the sale of gas and new consumers added at an average rate of over one a fortnight. You will say that these figures do not indicate any great increase in business, and we quite agree. But when we bear in mind the great industrial depression through which St. Austell, in common with the whole of the country, has been passing, and the stringency in the circulation of money, it is a matter of very real satisfaction that this Company has been able at least to maintain its business and to register a slight increase during the past year. It is a striking tribute to the energy of our staff and the satisfactory service we render to our consumers.

Shanklin.

The Annual General Meeting of the Shanklin Gas Company took place on Feb. 18. Mr. R. R. Russell, Chairman of Directors, presided, supported by Messrs. W. T. Deeks (Deputy-Chairman), W. Russell, F. W. Taylor, and the Manager (Mr. F. C. Taylor). On the revenue account the receipts for the sale of gas showed an increase of £458 over the previous year, and the sale of residuals £546 increase, but the expenses were also larger, owing chiefly to the fact that the sum of £451 was placed to the renewal fund, bringing that fund up to £4647. The output of gas showed steady progress, the output for 1930 being 72,211,000 c.ft.—an increase over 1929 of 1,886,600 c.ft., or 3 p.ct. The balance standing to the credit of the profit and loss account was £11,802, after payment of an interim dividend of 4 p.ct., *less* income-tax. The Directors recommended the declaration of a final dividend of 4 p.ct. for the half-year, making 8 p.ct. for the year, *less* income-tax.

South Staffordshire Mond.

The amount of fuel gasified by the South Staffordshire Mond Gas Company during the year is 8 p.ct. more than last year, while the cost of fuel gasified is 10½ p.ct. more than for 1929. The gas distributed during the year is 8 p.ct. more than during 1929. The gross profit for the year is £18,826, which, after deducting prior lien and debenture stock interest, leaves the net profit for the year £5910. The sum of £15,818 has been brought forward from the previous year, which makes the amount of undivided profit standing to the credit of the profit and loss account at Dec. 31, 1930, £21,728. The Directors deem it expedient to conserve the financial resources of the Company, and they do not, therefore, recommend the payment of any dividends.

Sunderland.

The profit and loss account of the Sunderland Gas Company shows that, after deducting interim dividend, there is an available balance of £23,095, out of which the Directors recommend the payment of a final dividend of 3 p.ct. (*less* income-tax),

making 6 p.ct. for the year, leaving £14,109 to be carried forward.

Ventnor.

The Ordinary General Meeting of the Ventnor Gas and Water Company was held at the Company's offices on Feb. 17, Mr. V. G. Middleton, Chairman of Directors, presiding. The Chairman, dealing with the accounts, said the balance standing to the credit of profit and loss account was £2304, subject to the payment of a dividend of 8 p.ct. on the original capital shares and £5 12s. p.ct. on the additional capital shares, less income-tax. The expenses on the revenue account are less than the previous year by £592. The total receipts from all sources are £16,386, as compared with £16,004 in the previous year. There has been an increase in the sale of gas of 7·56 p.ct. over the previous year and a substantial decrease in the gas unaccounted for. The number of new appliances fixed during the year include 104 gas cookers, 45 gas fires, 14 geysers, 12 wash-coppers, 35 gas rings, five radiators, and 98 incandescent burners; and 68 new consumers have been connected to the mains. The report stated that during the past year a two-lift spiral gasholder of 126,000 c.ft. capacity has been erected, and that the whole of the Company's works and mains have been maintained in a thorough state of efficiency. The report and balance sheet were then adopted unanimously.

Weston-super-Mare.

The sales of gas by the Weston-super-Mare Gaslight Company show an increase of 0·35 p.ct., and the total amount of gas consumed exceeds 412 million c.ft. In March last the sum of £30,000 6 p.ct. redeemable preference stock (redeemable Jan. 1, 1940) was issued, and was largely over-subscribed. The Directors recommend the payment of the maximum dividend of 5 p.ct. on the ordinary stock, the maximum dividend of 6½ p.ct. on the 6½ p.ct. redeemable preference stock, and the maximum dividend of 6 p.ct. on the 6 p.ct. redeemable preference stock, for the half-year ended Dec. 31, 1930, *less* income-tax.

Whitby.

The Directors of the Whitby Gas Company submit the following report for the year ended Dec. 31, 1930. The profit and loss (net revenue) account, after charging the same with interest on debenture stock, interest on preference stock, interest on banking account, and interest on deposits, and after providing for the interim dividend paid to June 30 last, shows a balance of £3182, out of which the Directors recommend the payment of dividends at the rate of 3 p.ct., *less* income-tax, on the original capital, and £2 2s. p.ct., *less* income-tax, on the additional and new additional capital, for the half-year ended Dec. 31, 1930, making with the interim dividends paid for the half-year ended June 30, 1930, 6 p.ct. on the original capital, and £4 4s. p.ct. on the additional and new additional capital for the year. This will absorb £918, leaving a balance of £2264 to carry forward. During the year 218 new consumers have been connected up.

Wolverhampton.

The gross profit of the Wolverhampton Gas Company for the year is £37,001, out of which has been paid £6340 interest on debenture stock, the net profit being £30,661. An interim half-year's dividend was paid in August, 1930, at the following rates—viz., 3 p.ct. on the preference stock; 5½ p.ct. on the consolidated stock; and 3½ p.ct. on the new ordinary stock; and the Directors recommend dividends at the same rates for the half-year ended Dec. 31, 1930—all *less* income-tax. The payment of the two half-yearly dividends will require £17,606. They also recommend that the sum of £5337 be placed to the reserve fund. The Directors regret for the first time for many years they have to record a decrease in the consumption of gas as compared with that for the preceding year, the output for which year, however, was exceptional owing to weather conditions. The number of consumers and the sale of all types of appliances, however, continue to show steady increase, and the Directors are confident that with a return to normal conditions they will be able to report the usual growth in consumption.

Worthing.

The total quantity of gas sold by the Worthing Gas Light and Coke Company shows an increase of 1·13 p.ct. as compared with the previous year. The Directors have raised during the year £25,979 by the issue of £25,000 5½ p.ct. irredeemable preference stock; and £1495 consolidated ordinary stock to the co-partners. Mortgages amounting to £7150—carrying interest at 5½ p.ct.—became redeemable on Jan. 1; £6400 of this sum remains on mortgage at the same rate of interest, and the balance of £750 has been repaid to mortgagees who desired repayment. The profit and loss account shows a balance of £42,574. The Directors have paid dividends (less income-tax) of £5 10s. p.ct. per annum on the preference stock and £7 p.ct. per annum on the consolidated ordinary stock for the half-year to June 30, 1930, and now recommend the declaration of dividends (less income-tax) at the rate of £5 10s. p.ct. per annum on the preference stock and £7 p.ct. per annum on the consolidated ordinary stock of the Company for the half-year to Dec. 21, 1930.

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GAS MARKETS & MANUFACTURES

Stock Market Report.

[For Stock and Share List, see later page.]

Quieter conditions prevailed in most sections of the Stock Exchange during the greater part of last week, and the volume of business on Friday, the last day of the account, was particularly light. Prices, however, were not materially affected, and there is no doubt that the political events of the past few weeks have given rise to a quiet optimism with regard to the future. A satisfactory feature was the harder tendency shown by India stocks, while other British Funds maintained their former high level.

Gas stocks and shares were in good demand; and it will be seen by the Stock and Share List that price changes, though few, were on the upgrade. The two Indian issues strengthened—viz., Bombay £1 shares by 1s. to 16s.-18s., on the announcement of an increased final dividend distribution of 4½ p.ct. (against 4 p.ct.), and Oriental ordinary stock by 2½ points to 100-110. Hornsey 3½ p.ct., rose 3 to 89-91. This price is still on the low side when compared with that of other companies shown in the List which have distributed a similar rate of dividend (6 p.ct.), though the security in each case is practically identical. Last year's highest recorded transaction was at 93. The Company has paid 6 p.ct. for the past two years, and on this basis the yield at the current price works out at £6 12s. 6d. p.ct.

The accounts of the Alliance and Dublin Consumers' Gas Company for the half-year show a profit on the revenue account of £69,500 (against £72,004 for the corresponding half-year). After providing for interest charges and income-tax, there remains £59,958, which together with £32,668 brought forward from the last account makes a total of £92,626 available. The Directors recommend a dividend at the maximum statutory rate of £7 12s. 6d. p.ct. per annum (same), which will absorb £59,165, leaving £33,461 to be carried forward to the next account. The present price of the Company's ordinary stock is 102½, so that the yield at this rate of dividend is £7 8s. 9d. p.ct.

It has been announced that the Bill promoted by the Gas Light and Coke Company has been sent to the Unopposed Bill Committee of the House of Lords, all opposition having been withdrawn. Sanction is given under the Bill to the transfer to the Company of the Southend-on-Sea and District Gas Company and the Brentwood Gas Company, to take effect as from Jan. 1, 1932. Powers are also included to establish the basic price and dividend principle.

Current Sales of Gas Products.

The London Market for Tar, Tar Products, and Sulphate.

LONDON, *March* 16.

The values of tar products remain unchanged, and are as follows:

Pitch, 45s. per ton f.o.b.

Creosote, for export, 5½d. per gallon f.o.b.

Pure toluole, 1s. 11d. per gallon; pure benzole, about 1s. 8d. per gallon; solvent naphtha, 95/160, about 1s. 5d. per gallon; and pyridine bases, 3s. 6d. to 3s. 9d. per gallon. All prices of spirits are *ex* sellers' works.

Tar Products in the Provinces.

March 16.

The average prices of gas-works products during the week were: Gas-works tar, 17s. 6d. to 21s. 6d. Pitch—East Coast, 42s. 6d. to 43s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 42s. 6d. to 43s. f.o.b.* Toluole, naked, North, 1s. 6½d. to 1s. 7½d. Coal-tar crude naphtha, in bulk, North, 6½d. to 7½d. Solvent naphtha, naked, North, 1s. 2d. to 1s. 2½d. Heavy naphtha, North, 11d. to 1s. Creosote, in bulk, North, liquid and salty, 3½d. to 3½d.; low gravity, 1½d.; Scotland, 3½d. to 3½d. Heavy oils, in bulk, North, 5⅞d. to 5⅞d. Carbolic acid, 60's, 1s. 1d. to 1s. 2d. Naphthalene, £10 to £12. Salts, £3 to £5, bags included. Anthracene, "A" quality, 2½d. per minimum 40 p.ct., purely nominal; "B" quality, unsaleable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port, it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *March* 14.

Competition is very keen for any business which is being offered in refined tars, and, consequently, values have again been reduced. Coal tar pitch is also lower.

Pitch.—Export value is lower at about 40s. per ton f.o.b. Glasgow. Quotations for home trade are unchanged at 42s 6d. per ton f.o.r. in bulk.

Refined tar to Ministry of Transport Specification shows a further drop, the value for both prompt and forward being 2¼d. to 2¾d. per gallon f.o.r. makers' works naked.

Creosote.—Conditions are unchanged, there being a shortage of virgin oils. B.E.S.A. Specification is 2¾d. to 3d. per gallon; low gravity, 3⅝d. to 3⅝d. per gallon; and neutral oil, 3d. to 3¼d. per gallon—all f.o.r. makers' works in bulk.

Cresylic.—Trading is on a small scale, and prices are easier. Pale, 97/99 p.ct. is 1s. 5d. to 1s. 6d. per gallon; dark, 97/99 p.ct., 1s. 4d. to 1s. 5d. per gallon; and pale, 99/100 p.ct., 1s. 7d. to 1s. 8d. per gallon—all *ex* works.

Crude naphtha.—Available supplies obtain 4d. to 4½d. per gallon f.o.r. works in bulk.

Solvent naphtha.—Few orders are being placed. 90/160 is 1s. 2d. to 1s. 3d. per gallon, and 90/190, about 1s. per gallon.

Motor benzole.—Value is nominal at 1s. 2d. to 1s. 3d. per gallon in this area.

Pyridines.—90/160 remains at 3s. to 3s. 3d. per gallon.

Benzole Prices.

These are considered to be the market prices for benzole:

	s. d.		s. d.	
Crude benzole	0 5½	to	0 6½	per gallon at works
Motor ,,	1 0	,,	1 1	,, ,, ,,
Pure ,,	1 5½	,,	1 6½	,, ,, ,,

New Capital Issues.

Plymouth and Stonehouse Company.—The issue of £70,000 5 p.ct. perpetual debenture stock by the Plymouth and Stonehouse Gas Light and Coke Company was over-subscribed, the applications totalling £201,875. The highest price at which stock was allotted was £102, the average price £98 9s. 10d., and the lowest price £98. The subscribers numbered 214, and the average allotment was £320, a fair proportion of the sum being subscribed from Plymouth.

Bedford District Gas Company.—As will be seen from our advertisement columns, Messrs. A. & W. Richards, of 37, Walbrook, E.C. 4, are offering for sale by tender, on behalf of the Directors of the Bedford District Gas Company, an issue of £20,000 5 p.ct. perpetual debenture stock at a minimum price of issue of £98 per £100 stock, yielding at that price £5 2s. p.ct. Tenders, which must be in amounts or multiples of £1, must be received not later than 11 o'clock a.m. on Wednesday, March 25.

Trade Notes.

New Premises for Economic Boilers.

Intimation has been received from the Economic Gas Boiler Company, Ltd., that they have moved into new and larger premises; their present address being Junction Mills, Burnley.

Chemicals and Coke Ovens, Ltd.

The registered office of this Company has been transferred to Vintry House, Queen Street Place, London, E.C. 4. The Sheffield office has been closed, and all correspondence should now be sent to the London office.

Users of Gledhill-Brook Time Recorders.

Among the firms who are users of Gledhill-Brook time recorders are Messrs. W. C. Holmes & Co., of Huddersfield, and the Wandsworth, Wimbledon, and Epsom District Gas Company. The Gledhill-Brook time recorder is British throughout, reliable, accurate, and unfailing in its service. An accurate, speedy, and clean method of reproducing forms is offered by the "Facsimo" process, another efficient machine produced by Messrs. Gledhill-Brook Time Recorders, Ltd. "Facsimo" is a modern adaptation of the gelatine process. It will copy anything typed, written, drawn (pen or pencil), or printed. It will produce up to 100 copies from one original. "Facsimo" eliminates re-writing and will reproduce five different colours (pen or pencil) by one simple operation without stencils or type-setting.

STOCK AND SHARE LIST.

[For Stock Market Report, see earlier pages.]

Issue.	Share.	When ex-Dividend.	Dividends. Prev. Hf. Yr.	Dividends. Last Hf. Yr.	NAME.	Quotations. Mar. 13.	Rise or Fall on Week.	Transactions. Lowest and Highest Prices During the Week.
£			% p.a.	% p.a.				
171,978	Stk.	Feb. 5	5	5	Aldershot 5 p.c. max. C. ...	73—78	...	...
522,992	,,	,,	4	4	Do. 4 p.c. Pref. ...	75—80	...	...
1,551,868	,,	Oct. 9	7⅞	7⅞	Alliance & Dublin Ord. ...	100—105	...	100—103
374,000	,,	Jan. 8	4	4	Do. 4 p.c. Deb. ...	70—75	...	...
522,655	,,	Mar. 5	7	7	Barnet Ord. 7 p.c.	115—120*	...	...
300,000	1	Oct. 23	1/7½	1/4½	Bombay, Ltd.	16/—18/-	+1/-	...
174,500	10	Mar. 5	9	9	Bournemouth 5 p.c. ...	14½—15½*	...	15
500,050	10	,,	7	7	Do. B 7 p.c. ...	12½—13*	...	...
439,160	10	,,	6	6	Do. Pref. 6 p.c. ...	10¾—11¼*	...	...
50,000	Stk.	Dec. 18	3	3	Do. 3 p.c. Deb. ...	60—63	...	...
162,025	,,	,,	4	4	Do. 4 p.c. Deb. ...	81—84	...	...
357,900	,,	Aug. 28	7½	7½	Brighton & Hove 6 p.c. Con.	112—117	...	...
371,880	,,	,,	6¾	6¾	Do. 5 p.c. Con.	102—105	...	...
1,287,500	,,	Feb. 19	5	5	Bristol 5 p.c. max.	94—95a	+½	...
120,420	,,	Dec. 18	—	—	Do. 1st 4 p.c. Deb. ...	78—80	...	...
217,870	,,	,,	—	—	Do. 2nd 4 p.c. Deb. ...	78—80	...	...
328,730	,,	,,	—	—	Do. 5 p.c. Deb.	95—97	...	...
855,000	,,	Sept. 25	8	7	British Ord.	110—115	...	115
100,000	,,	Dec. 18	7	7	Do. 7 p.c. Pref.	109—114	...	...
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	74—77	...	...
450,000	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	92—97	...	...
160,000	,,	Jan. 8	5	5	Cambridge 5 p.c. Deb. ...	95—98	...	...
100,000	10	Dec. 4	10	6	Cape Town, Ltd.	9½—10¼	...	...
100,000	10	Nov. 6	4½	4½	Do. 4½ p.c. Pref. ...	6¾—7½	...	...
150,000	Stk.	Dec. 18	4½	4½	Do. 4½ p.c. Deb. ...	72—77	...	74¼—75
626,860	,,	Feb. 19	6	6	Cardiff Con. Ord.	95—98	...	...
237,860	,,	Jan. 8	7½	7½	Do. 7½ p.c. Red. Deb. ...	97—100	...	...
157,150	,,	Feb. 19	5	6¼	Chester 5 p.c. Ord.	83¼—88⅛b	...	...
98,936	1	Oct. 9	†2/-	†2/-	Colombo, Ltd. Ord.... ...	32/—34/-	...	...
24,500	1	,,	1/4⅜	1/4⅜	Do. 7 p.c. Pref.	18/—20/-	...	...
609,204	1	Oct. 9	1/9⅜	1/4⅜	Colonial Gas Assn. Ltd. Ord.	16/6—18/6	...	...
296,053	1	,,	1/7½	1/7⅛	Do. 8 p.c. Pref.	18/—20/-	...	...
2,073,280	Stk.	Feb. 19	6	6	Commercial Ord.	93—96	...	94½—95
475,000	,,	Dec. 18	3	3	Do. 3 p.c. Deb. ...	57—60	...	57½
787,560	,,	Feb. 19	7	7	Croydon sliding scale ...	107—110	+1	...
453,100	,,	,,	5	5	Do. max. div.	82—85	...	84—84½
542,270	,,	Mar. 5	7	10	Derby Con.	120—123*	...	...
55,000	,,	Dec. 18	4	4	Do. Deb.	65—70c	...	...
200,000	,,	Mar. 5	5	5	East Hull Ord. 5 p.c. ...	72—75*	...	...
1,002,180	,,	Sept. 25	†7g	†4	European, Ltd.	97—107	...	98—102½
18,953,033	,,	Feb. 19	5⅝	5⅝	Gas Light & Coke 4 p.c. Ord.	18/3—19/3.f	...	18/4½—18/10½
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max.	62—65	...	62½—64
4,294,691	,,	,,	4	4	Do. 4 p.c. Con. Pref. ...	77—80	...	77—78½
5,694,095	,,	Dec. 18	3	3	Do. 3 p.c. Con. Deb. ...	60—63	...	60½—61⅝
3,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	100—103	...	101—102¼
161,480	,,	Mar. 5	10	10	Harrogate Cons. 10 p.c. max.	158—163*	...	...
82,500	,,	Aug. 28	7	7	Hastings & St. L. 5 p.c. Conv.	98—103	...	...
258,740	,,	,,	5½	5½	Do. 3½ p.c. Conv.	82—85	...	...
70,000	10	Oct. 9	§	10	Hongkong & China, Ltd. ...	13—14	...	...
213,200	Stk.	Mar. 5	6	6	Hornsey Con. 3½ p.c. ...	89—92*	+3	90—91
2,436,594	,,	Nov. 6	25	15	Imperial Continental Cap.	350—370	...	359—365
223,130	,,	Feb. 5	3½	3½	Do. 3½ p.c. Red. Deb.	78—83	...	82½—82⅝
235,242	,,	Mar. 5	8½	8½	Lea Bridge 5 p.c. Ord. ...	124—129*	...	127—129
2,145,907	,,	Feb. 19	6	6	Liverpool 5 p.c. Ord. ...	97—98b	+½	...
600,000	,,	Sept. 25	7	7	Do. 7 p.c. Red. Pref.	99—101f	...	...
165,736	,,	Feb. 19	9	9	Maidstone 5 p.c. Cap. ...	128—133	...	129—130
63,480	,,	Dec. 18	3	3	Do. 3 p.c. Deb. ...	54—57	...	54—55
75,000	5	Dec. 4	†10	†10	Malta & Mediterranean ...	6—6½	...	...
392,000	—	Oct. 1	5½	5½	Metropolitan (of Melbourne) 5½ p.c. Red. Deb.	88—91	...	...
675,000	Stk.	Nov. 20	†8	†6	Montevideo, Ltd.	95—105	...	95
2,061,315	,,	Mar. 5	5	5½	Newcastle & Gateshead Con.	17/9—18/3d.f	...	...
682,856	,,	,,	4	4	Do. 4 p.c. Pref. ...	72½—74¼d*	...	...
691,705	,,	Jan. 8	3½	3½	Do. 3½ p.c. Deb. ...	67½—68¾d	...	...
277,285	,,	Nov. 5	5	5	Do. 5 p.c. Red. Deb.	98—100d	...	...
199,940	,,	Mar. 5	7½	7½	North Middlesex 6 p.c. Con.	115—120*	...	...
396,160	,,	Feb. 5	5	5	Northampton 5 p.c. max. ...	74—79	...	...
300,000	,,	Nov. 20	7	9	Oriental, Ltd.	100—110	+2½	...
60,000	5	13 May, '15	—	—	Ottoman	0—⅛	...	...
205,162	Stk.	Dec. 18	8	8	Plym'th & Stonehouse 5 p.c.	110—115	...	...
424,416	,,	Feb. 19	8	8	Portsm'th Con.Stk. 4 p.c.Std.	122—127	...	124
241,446	,,	,,	5	5	Do. 5 p.c. max. ...	78—81	...	79—80
686,312	,,	Jan. 22	4	4	Primitiva 4 p.c. Rd. Db. 1911	83—86	+1	...
389,813	,,	Dec. 18	4	4	Do. 4 p.c. Cons. Deb.	84—87	+1	86¼
150,000	10	Sept. 25	6	6	San Paulo 6 p.c. Pref. ...	8⅜—8⅝	...	8⅛
1,736,968	Stk.	Aug. 28	6½	6½	Sheffield Cons.	105—107c	...	...
95,000	,,	Jan. 8	4	4	Do. 4 p.c. Deb.	78—80c	...	...
90,000	10	June 5	†4	†5	South African	4—6	...	5½
6,709,895	Stk.	Feb. 5	5	7½	South Met. Ord.	103—106	...	103⅝—104⅜
1,135,812	,,	,,	6	6	Do. 6 p.c. Irred. Pf.	111—114	...	113—113¼
1,895,445	,,	Jan. 8	3	3	Do. 3 p.c. Deb. ...	59—62	...	60½
734,000	,,	Mar. 5	6½	6½	Do. 6½ p.c. Red. Db.	97—100*	...	...
1,000,000	,,	Jan. 22	—	4	Do. 5 p.c. Red. Deb.	100—103	...	102½
91,500	,,	Mar. 5	8½	8½	South Shields Con.	107—109*	...	...
1,543,795	,,	Feb. 19	6½	6½	South Suburban Ord. 5 p.c.	101—104	...	103—104
668,837	,,	Dec. 18	5	5	Do. 5 p.c. Deb.	100—103	...	...
647,740	,,	Feb. 19	5	5	Southampt'n Ord. 5 p.c. max.	73—76	...	...
121,275	,,	Dec. 18	4	4	Do. 4 p.c. Deb.	75—78	...	...
179,014	,,	Mar. 5	8	8	Sutton Ord.	120—130*	...	...
94,500	,,	Jan. 8	5	5	Do. 5 p.c. Deb.	96—99	...	...
250,000	,,	Mar. 5	7	7	Swansea 7 p.c. Red. Pref. ...	96—99*	...	...
200,000	,,	Dec. 18	6½	6½	Do. 6½ p.c. Red. Deb.	100—103	...	...
1,076,490	,,	Mar. 5	6⅝	6⅝	Tottenham District Ord. ...	101—105*	...	104—104¼
150,000	,,	,,	5½	5½	Do. 5½ p.c. Pref. ...	101—104*	...	...
199,005	,,	Dec. 18	4	4	Do. 4 p.c. Deb. ...	77—80	...	...
85,701	,,	Sept. 25	6	6	Tuscan, Ltd., 6 p.c. Red. Db.	74—79	...	...
310,694	,,	Mar. 5	7	7	Uxbridge, Maidenhead, & Wycombe 5 p.c.	95—100*	...	95½
88,330	,,	,,	5	5	Do. 5 p.c. Pref. ...	88—93*	...	...
1,322,220	,,	Mar. 5	7	7	Wandsworth, Wimbledon, and Epsom Cons. ...	110—113*	...	...
426,000	,,	,,	5	5	Do. 5 p.c. Pref.	93—96*	...	94½—96
1,013,464	,,	Dec. 18	5	5	Do. 5 p.c. Deb.	100—103	...	102¼

Quotations at :—*a.*—Bristol. *b.*—Liverpool. *c.*—Nottingham. *d.*—Newcastle. *e.*—Sheffield. *f.*—The quotation is per £1 of stock. *g.*—Paid on £10 Shares. * Ex. div. † Paid free of income-tax. ‡ For year. § Div. = 10 p.ct. p.a. less tax and less tax on interim dividend.

STOCK ISSUE.

By Order of the Directors.

THE BEDFORD DISTRICT GAS COMPANY.

Messrs. A. & W. RICHARDS

are Instructed to OFFER FOR SALE BY TENDER

£20,000

FIVE PER CENT. PERPETUAL DEBENTURE STOCK.

Minimum Price of Issue, £98 per £100.
Yielding at that Price, £5 2s. per cent.

Prospectus and Form of Tender (which latter must be sent in by 11 o'clock on Wednesday, March 25) may be obtained of A. & W. RICHARDS, 37, WALBROOK, E.C. 4.

By Order of the Directors.

THE UXBRIDGE, MAIDENHEAD, WYCOMBE, AND DISTRICT GAS COMPANY.

(Incorporated 1861.)

Messrs. A. & W. RICHARDS

are Instructed to OFFER FOR SALE BY TENDER

£51,557

FIVE PER CENT. PERPETUAL DEBENTURE STOCK.

Minimum Price of Issue, £98 per £100.
Yielding at that Price, £5 2s. per cent.; and

£33,575

ORDINARY STOCK,

ranking for a Standard Dividend of 5 per cent., subject to the Sliding Scale, equally with existing similar Stock now receiving 7 per cent.

Minimum Price of Issue, £105 per £100.
Yielding at that Price, £6 13s. 4d. per cent.

Prospectus and Forms of Tender (which latter must be sent in by 11 o'clock on Tuesday, March 31) may be obtained of A. & W. RICHARDS, 37, WALBROOK, E.C. 4.

By Order of the Directors.

NEW ISSUE OF ORDINARY CAPITAL.

BARNET DISTRICT GAS AND WATER COMPANY.

(Incorporated by Special Act of Parliament, 1872.)

The Directors invite TENDERS for

£35,000

ORDINARY STOCK,

ranking for a maximum Dividend of 7 per cent. per annum, equally with the existing similar Stock now receiving that rate.

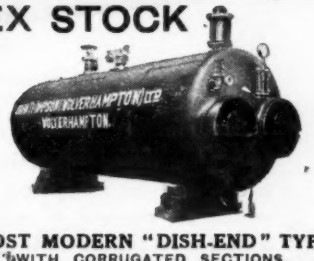
Minimum Price of Issue, £120 per £100,
Yielding £5 16s. 8d. per cent.

Prospectus and Form of Tender (which must be sent in by 11 o'clock on Monday, March 30, 1931) may be obtained at the COMPANY'S OFFICES, 139, CANNON STREET, LONDON, E.C. 4, and at STATION ROAD, NEW BARNET.

NEW "THOMPSON"

BOILERS

EX STOCK



MOST MODERN "DISH-END" TYPE WITH CORRUGATED SECTIONS.

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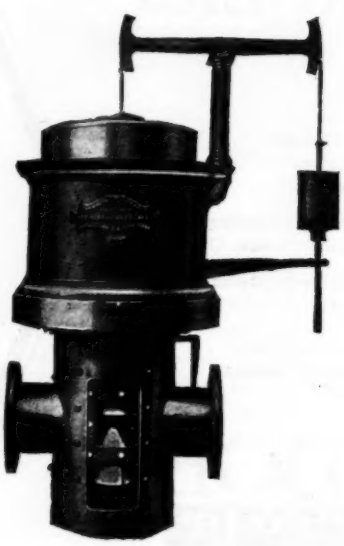

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